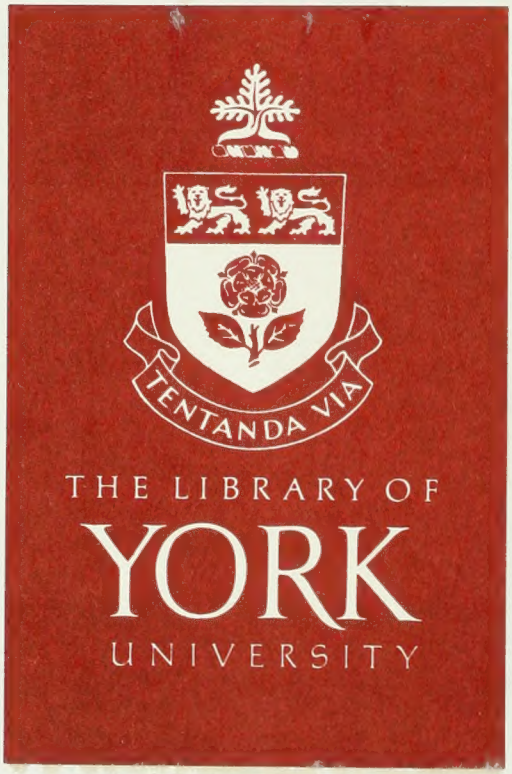
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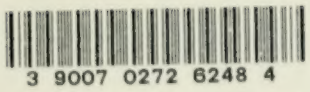
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Ontario

Report of the Royal Commission on the Status of Pensions in Ontario

VOLUME V

Ontario and the Canada Pension Plan

1980

Report of the Royal Commission on the Status of Pensions in Ontario

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Ontario and the Canada Pension Plan

The Royal Commission on the Status of Pensions in Ontario

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Report of the Royal Commission on the Status of Pensions in Ontario

VOLUME V – VII

Ontario and the Canada Pension Plan

1980

Foreword

The Commission's position is that retirement income provision is primarily an individual responsibility. It sees the role of government to be threefold:

1. to provide a minimum adequate income in retirement for everyone;

2. to provide a social scheme for replacement of pre-retirement income in retirement at low levels of income;

3. to provide incentives for the individual to make his or her own arrangements for retirement income.

The Canada Pension Plan is the method by which government up to now, has sought to carry out the second of these roles. After extensive study the Commission is satisfied that the plan, although the subject of much criticism in recent years, should continue to play a large part in the social security design.

The Commission makes a number of recommendations on the course the Government of Ontario should follow to secure the future operation of the CPP. While the full discussion warrants a separate volume of the report, this is not to suggest that the CPP recommendations should be considered in isolation. The mandatory plan (PURS) recommended in an earlier part of the report is to be seen as a key component for an effective social security scheme. The Canada Pension Plan is only one piece, albeit an important one, in the mosaic of Design for Retirement.

How much government can do in fulfilling its various roles will be governed by cost and social priorities. We have attempted an assessment of the future cost of all social security aspects, encompassing Old Age Security with its Guaranteed Income Supplement and Spouse's Allowance, GAINS, and the Canada Pension Plan. Only by looking at potential overall cost can we judge whether more can and should be done to provide income in retirement through government means.

Donna J. Haley, Q.C.
Chairman

Introduction

Typical of public concerns are the following comments from "Canada Pension dues will have to increase," by Dian Cohen, in the Montreal Star, November 20, 1977:

> "....the Canadian Pension Plan will run out of money long before today's 'prime age workers' reach retirement age."
>
> "....Right now, there is one retired person for every seven working people. Fifty years from now, there will be more than two retired people for every seven working people. This means that even if there is no increase in the average income of the retired, the pension burden must more than double."
>
> "....But those reserves now fall far below actuarial standards that would ensure that every retired Canadian worker gets a retirement income."
>
> "....Not only is a lot of this pension money (from the CPP) being invested at substandard rates, there are suggestions that it isn't being invested at all, but is being used to pay for current expenses."
>
> "....It's interesting that the push nowadays for an end to mandatory retirement coincides with an increasingly wide recognition that retirement money is running out."

These same problems are described in more sophisticated terms by Laurence Coward, Vice-President of William M. Mercer Limited:

> "The current arrangement became a cause for concern for several reasons. First the projections in the actuarial reports on the Canada Pension Plan showed that the benefit outgo would increase much faster than the contribution income. Thus, according to the 1973 actuarial report, the benefit payments from the Canada Pension Plan would first exceed the contribution income in 1982. Further,

unless the plan were amended by law the benefit outgo would exceed the contributions plus interest on the investments in 1988. At this point the fund would begin to decrease and the fund would be totally exhausted by the year 1999. Although similar projections were made when the Canada Pension Plan was started and it was well understood that contributions would have to be raised at some time, the projections showed that the time for action was near.

"During the early 1970s the position of many employer pension plans deteriorated. Salaries and wages rose fast in an attempt to keep up with inflation. Pension costs and liabilities rose in sympathy with earnings and, at the same time, the market value of pension fund assets fell. Substantial deficits were shown in many actuarial valuations. Under the Pension Benefits Acts such 'experience deficiencies' normally have to be made up by special payments within five years from the valuation date. Some employers had difficulty in meeting the extra payments required and there was much discussion of the supposed 'crisis in pensions.' Scare stories appeared in the news media and many people came to believe that all pension plans were in trouble, including private sector plans, plans for government employees and social security plans.

"In 1972 and 1973 the Government of Canada, in response to growing inflation, added cost of living indexing to nearly all of the programs for which it was responsible. Full adjustments for increases in the CPI were added to Old Age Security, Canada Pension Plan, Unemployment Insurance and pensions for federal public servants. The very high potential cost of this unlimited indexing gradually became apparent.

"Attention was also focused on demographic trends. The changing age distribution was clearly seen in the large number of young people trying to enter the labour force at a time of serious unemployment, while school enrolment fell drastically leaving a surplus of schools and teachers. The post-war 'baby boom' was a remarkable phenomenon. In the 1950s fertility rates reached a level that had not been known for many decades. In the period 1945 to 1965 about 1-1/2 million children were born in Canada over and above what might be considered normal, although of course opinions may differ as to how the norm should be defined. During the 1960s the birth rate fell steadily and in recent years has been exceptionally low. In fact the current birth rate is below replacement level so that if it continued indefinitely it would result in a falling population.

"Concern was expressed that, when people born in the 'baby boom' years retired after 2015, the burden on the working population would then be so great that the government might renege on its promises and cut back on CPP benefits. For these reasons a belief

grew that the Canada Pension Plan was unsoundly financed and that a much larger fund should be built up from increased contributions.

"To sum up, serious misgivings as to the soundness of the Canadian pension system arose as a result of the need to raise CPP contributions in the 1980s, the deficits in employer pension plans caused by inflation, the high cost of indexing pensions and the baby boom."(1)

All of these concerns, whether expressed in popular terms or in the language of the pension industry, continue today with different facets coming to the fore as more reports are received on declining population trends, unemployment, and increasing inflation.

At the same time that it became clear that decisions on the future of the Canada Pension Plan (CPP) would have to be made soon, the Treasurer of Ontario called for consideration of a scheme for funding the CPP along the lines required for employment pension plans.(2) As well as reducing the intergenerational subsidy problem it was suggested that the funding of the CPP on more or less conventional lines would generate a very large capital pool which, if invested in productive enterprises, would stimulate the economy, create jobs, and raise the standard of living.

There is disagreement on whether the Canada Pension Plan is the proper place to raise money for Canada's capital needs. There is also doubt whether provincial governments would invest the capital generated by the CPP in productive enterprises or treat it as general revenue. Some argue that the experience over the years since the commencement of the CPP suggests that the funds already accumulated have not been wisely used by the provinces and that capital investment has not been raised significantly or has actually been impaired.

Full funding of the CPP has implications for both contribution levels and fund size which have been attacked by those favouring the continuance of a basic pay-as-you-go approach. The arguments run along the following lines:

- To provide for a larger fund would, of course, mean increasing contributions from employers and workers even more than they would have to be increased under present arrangements. Such increased contributions constitute a regressive tax, bearing most heavily on low-income workers and less heavily on those who earn more than the Year's Maximum Pensionable Earnings (YMPE).(3) Such a tax would tend to depress the economy at a time when, according to many experts, stimulation is needed. Further, other forms of saving might be reduced because of the forced saving in the Canada Pension Plan.

- Stronger funding of the CPP would aggravate the problems of managing the fund. If such a fund were invested entirely in government securities would the money so invested ultimately be used to maximize the productive capacity of the country? If billions of dollars of CPP funds were invested in marketable securities, the transactions of CPP fund managers would tend to dominate the stock and bond markets. Investment responsibility would have to be divided among a considerable number of investment managers if the market were to operate at all normally after such a vast influx of funds. Difficult questions concerning the ownership and control of business enterprises and the competitiveness and efficiency of the security markets would have to be answered.

The high level of public awareness of the Canada Pension Plan underlines the need to examine all these concerns in depth. It is important that the public have confidence in a public pension scheme which for many will be the only source of employment-related retirement income. It is even more important that public confidence be placed only in a sound and efficient vehicle. The Commission therefore has undertaken extensive projections in order to establish a factual base from which each of the concerns can be explored. Not all will agree with the Commission's conclusions drawn from facts, but all of the data are available for careful study. Selected tables from the Commission's projections are published in several appendices in this volume. The complete computer runs from which the tables were constructed have been filed with the Ontario Archivist and are available for study. It is time that statements about the Canada Pension Plan were based on a full understanding of the nature of its problems and with just consideration of the long-run consequences of any solutions that may be considered in the next few years.

NOTES

(1) Laurence E. Coward, draft paper prepared for the Royal Commission on funding of the Canada Pension Plan.

(2) Ministry of Treasury, Economics, and Intergovernmental Affairs, "Review of Issues in Financing the Canada Pension Plan," April 1976.

(3) For an explanation of "Year's Maximum Pensionable Earnings" and other technical terms in the text see the Glossary, Volume III.

Ontario and the Canada Pension Plan

Volume V

Contents

Foreword iv

Introduction v

1. HISTORY OF THE CANADA PENSION PLAN 1

The Background 1
Clark Inquiry, 1958 2
Ontario's Initiative, 1962 2

The Debate 3
Proposed OAS Increase 3
CPP Proposals - Basic Features 4
Issues in Public Controversy 6
Revised Proposals, 1964 7
Bill C-75 and Provincial Response 8
Funding Basis 10
Amending Formula 11
Passage and Implementation 11

The Recent Past 12
Unilateral QPP Changes 13
CPP Amendments, 1973-1974 13
Recent Changes; Child-rearing Dropout Proposal 14
Funding: Still an Issue 15

Notes 17

Chronology of Historical Development 20

Table of Provisions and Amendments 23

2. SUMMARY OF PLAN FEATURES 25

3. DEMOGRAPHY 31

Population Projections 33
Fertility 34
Mortality 39
Conclusion 41

Notes 43

List of Tables 44

4. DEPENDENCY RATIOS 45

Effective Dependency 47

Validity of Demographic Concerns 49

Summary 51

Notes 53

List of Tables 54

5. FUNDING THE CANADA PENSION PLAN 55

What is Funding? 55
Pay-As-You-Go 55
Full Funding 55

Funding and Social Security Programs 55

Funding of the Canada Pension Plan 57
Funding Patterns 57
Full Funding Issue 58

The Commission's Projections for the Canada Pension Plan 59
The Commission's Fertility Assumptions 60

The Commission's Economic Assumptions 61
Other Assumptions 63
Areas for Analysis 63

Notes 66

List of Tables 67

6. ANALYSIS OF THE COMMISSION'S PROJECTIONS 68

Future Cost of Existing CPP Benefits 68
Future Cost of Existing CPP Benefits by Category 69
Future Cost for Ontario 69
Effect on Cost of Varying Assumptions 71
Effect of Funding Patterns on Cost Projections 74
Full Funding Projections with Pay-go Elements 76
Effect on Cost of Reintroduction of the Earnings Test 78
Comparison of the Commission's Projections with Statutory Actuarial Report No. 6 79

Notes 83

List of Tables 84

7. PROBLEMS IN THE FUNDING DESIGN OF THE CANADA PENSION PLAN 85

Problem Number 1 - Bankruptcy of the CPP 86

Problem Number 2 - Subsidies 87

Problem Number 3 - Does Pay-go Social Security Depress Savings? 92
Use of a Social Security Fund as an Economic Tool for Raising and Lowering the Acceptable Rate of Personal Saving in the Economy 95
How Large a Fund Would be Created by Full Funding? 95
Can Such a Large Fund be Utilized in the Canadian Capital Market? 95
How Can Effective Control be Exercised over the Fund Which Full Funding Would Create? 96
Conclusions on Full Funding 101

The Commission's Alternative to Full Funding 102

Notes 107

List of Tables 109

8. ISSUES RELATING TO BENEFIT FEATURES 110

Coverage 110
The Unpaid Worker 112

The Child-Rearing Dropout Provision 115

Survivor Benefits 118

Division of Pension Credits During Marriage 120

Level of Benefits 122
Should the Level of Benefits be Increased? 125

Retirement Age 128
a) Social Insurance or Not? 128
b) Retirement from Gainful Employment 129
c) Bridging the Gap 130
d) The Right to Choose Retirement Age 130
e) The Right to Accrue Increased Benefits 130
f) Cost Factors 131
Conclusion 131

Comparison of Social Security in the United States and in Canada 131
Why Is the Cost of the Canadian System Less Than That of the U.S.? 132

Appeals Procedure 134

Notes 136

List of Tables 138

9. CONCLUSIONS AND RECOMMENDATIONS 139

Conclusions 139

Recommendations 141

RESOURCE STUDIES 145

Comparison of the Royal Commission's Population Projection Assumptions with those of Statistics Canada
Ann Jamieson 145

A Review and Critical Analysis of the Economic Literature on Social Security
Arthur Donner and Fred Lazar 160

Methodology and Assumptions Adopted For Canada Pension Plan Financial Projections Undertaken by the Royal Commission on the Status of Pensions in Ontario
Keith H. Cooper and Ronald Adams 197

SELECTED TABLES FROM THE ROYAL COMMISSION'S PROJECTIONS 241

APPENDIX A - Population Projections 242

APPENDIX B - Dependency Ratios 250

APPENDIX C - Canada Pension Plan Projected Contributions and Expenditures 255

APPENDIX D - Canada Pension Plan Fund Analysis 272

APPENDIX E - Comparison of Royal Commission Projections with Statutory Actuarial Report No. 6 on the Canada Pension Plan as at December 31, 1977 297

APPENDIX F - Old Age Security, Guaranteed Income Supplement and Spouse's Allowance Projected Expenditures 303

APPENDIX G - Selected Canada Pension Plan Projections, Canada Less Quebec, based on the Royal Commission's High Economic and Low/Low Fertility Assumptions 310

INDEX 325

Chapter 1

History of the Canada Pension Plan

THE BACKGROUND

> "My ministers have undertaken to establish a comprehensive system of contributory pensions. The new pensions will be co-ordinated with the existing provisions for old-age security, for the purpose of enabling all Canadians to retire in security and with dignity. While the arrangements required for this great advance in the social security of our people are necessarily complex, the legislation submitted to you will be designed to make the new pension plan operative as soon as possible."(1)

These words on May 16, 1963 marked the first parliamentary appearance of what was to be the Canada Pension Plan, although it was by no means the first indication of federal government involvement in the retirement pension field. The federal election campaign of 1957 had seen the matter of contributory pensions raised, with the U.S. Social Security program cited as a model.(2) Canada was not alone in looking at the concept of a publicly supported earnings-related plan as an extension of the existing flat rate (OAS) benefit and, as in the past, the impetus for reform was not confined to this country. At the end of World War I the subject of old age pensions had appeared in the Labour Convention that became part of the Treaty of Versailles, and reflected views held in Europe and North America that social reform should be a priority in the postwar years. Canada's means-tested Old Age Pension came into being in 1927. Similarly, growing opposition to the means test after the Second World War led to the development of universal, flat-rate plans in a number of countries, with Canada's Old Age Security program being introduced in 1951. Later, as Kenneth Bryden relates in his book on old age pensions:

"...just as differing interests in opposition to the means test had converged in the late 1940s, so now those primarily concerned with controlling costs and those whose main motive was to improve benefits began to find common ground in advocating a contributory plan. It is worth noting that similar pressures were operating in other countries where the pension was on a flat-rate basis. Both the United Kingdom and Sweden, for example, superimposed contributory earnings-related pensions on their plans in 1959."(3)

Clark Inquiry, 1958

By that time, Canada had taken a step in the same direction. In 1958 the Government of Canada commissioned Professor R.M. Clark to prepare a comparative study of the Canadian Old Age Security plan and the U.S. Social Security plan, on the stated assumption that the latter provided superior benefits.(4) The Clark report, presented the following year, made no recommendations, but provided:

"...a comprehensive analysis of both public and private provision of pensions in the two countries and...a presentation of arguments for and against universal and contributory pensions. His exposition of how the U.S. system actually worked made it hard to escape the conclusion that it was not transferable to Canada. Nor was it by any means crystal clear, as Conservative speeches and even the terms of reference had assumed, that old age pensioners were treated more generously on the whole in the United States than in Canada."(5)

What did result from the study, however, was the government's decision that survivor and disability benefits ought to be an integral part of any earnings-related plan. To this end the Prime Minister, in January 1962, sought the agreement of the provinces on an amendment to Section 94A of the British North America Act (added in 1951 to allow Parliament to enact old age pensions) to permit survivor and disability benefits to be paid by the federal government. Nine provinces agreed(6) but Quebec refused assent in January 1963, and the proposal languished when the federal government was defeated in the election of April that year.

Ontario's Initiative, 1962

An important parallel development was the introduction, in April 1962, of a draft Pension Benefits Act in Ontario "for study and discussion only." Included in the bill were standards for vesting, funding, and portability of employment pensions; and, as a move toward broader coverage, pension plans were to be mandatory for employers with 15 or more employees. The same concerns about lack of coverage, solvency, and portability in employment plans that led successive federal governments to consider earnings-related plans(7) were reflected in Ontario's innovation, a provincially-portable plan with minimum benefits and

conditions. The Pension Benefits Act(8) was again introduced in March 1963 and passed by the legislature on April 26. At the same time, pension reform was being proposed in the province of Quebec, where a change in government in 1960 had been followed by a legislative program which emphasized on the one hand social policy changes and on the other, a desire for provincial autonomy in such matters.

THE DEBATE

In light of these provincial initiatives, it is understandable that contributory pensions were prominent in the 1963 federal election campaign; the Liberal, Conservative, and New Democratic parties were all committed to the principle.(9) Following the election, the matter of a contributory earnings-related plan became a priority in the "sixty days of decision" promised by the incoming government. As we have seen, the Speech from the Throne included a reference to "a comprehensive system of contributory pensions." A resolution was introduced in the House of Commons on June 21, 1963 and agreed to; and this was followed by the tabling of a White Paper on the subject, July 18. Meanwhile, the text of the resolution had been forwarded to the premiers with a suggestion for an early federal-provincial conference. Here it should be noted that the emerging Canada Pension Plan was being discussed against a backdrop of negotiations on direct federal loans to municipalities, youth allowances, student loans, and fiscal transfers; as a consequence, jurisdictional arguments were very much to the fore. The ultimate ceding of provincial jurisdiction to Parliament in order to establish the CPP could be attained only at the expense of significant changes in the original proposal - including some which could be said to improve rather than dilute the plan provisions.

Proposed OAS Increase

The June 21 resolution included the following provisions:

> "...for the payment of an additional pension of ten dollars a month to all persons to whom a pension may be paid under the Old Age Security Act; for the adjustment of pensions payable under the Old Age Security Act to co-ordinate such pensions with the new plan." (10)

The purpose of this measure, raising the OAS amount to $75 per month, was to compensate persons too old to benefit from the new Canada Pension Plan. Under the pay-as-you-go method of financing, contributions of CPP members would pay for the increased universal benefit; this meant an even more direct intergeneration subsidy than that which finally emerged in the structure of the plan. In addition, since reduced CPP benefits were to be available for retirement between ages 65 and 70, the same provision was extended to Old Age Security pensions, which were expected to range from $75 per month at age 70 down to $51 at age 65.

OAS Increased Independently

As the debate proceeded, and it became evident that completion of the Canada Pension Plan involved a more protracted process than originally envisaged, pressure grew for a separation of the $10 OAS increase from formulation of the contributory scheme. Consequently, the government introduced a resolution on September 30, 1963, increasing the OAS benefit to $75 per month and at the same time increasing from 3 per cent to 4 per cent the Old Age Security tax on personal incomes. The measure became effective on October 1. At the same time certain related programs were improved, as Bryden notes:

> "The Old Age Assistance, Blind Persons, and Disabled Persons Acts were also amended to raise to $75 a month the maximum means-test pensions in which the federal government would share, with corresponding increases in maximum allowable income....Seven provinces and the Yukon made these increases effective from December 1, 1963, and Newfoundland, Prince Edward Island, Quebec, and the Northwest Territories from April 1, 1964."(11)

In place of a reduction in benefits for earlier retirement, the age of eligibility for OAS would be reduced to 65 one year at a time, beginning in 1966. As further compensation for those already retired and unable to benefit from the new earnings-related plan the Guaranteed Income Supplement was introduced in 1967. A discussion of the development of OAS and GIS since the mid-1960s may be found in Volume I, Chapter 3.

CPP Proposals - Basic Features

The major provisions of the initial White Paper, the two federal acts and the Quebec proposal and the provisions in force in 1979 are compared in the chart at the end of this chapter. To be discussed here is the philosophy underlying the original provisions, and how it evolved to arrive at the design that was finally adopted in 1965. From the beginning the government declared its openness to suggested improvements:

> "...the contributory plan to which this government has bound itself is inflexible only in its main purpose. The government will therefore welcome from any member any contribution or suggestion genuinely designed to improve the legislation, particularly as all other parties have already committed themselves to the principle and idea of contributory pensions"(12)

The "main purpose" was defined in terms of certain widely accepted principles:

> "Each party has gone on record, reflecting the generally held feeling in this country, that such a scheme must be comprehensive

so that it applies to the widest possible group of Canadians, and it must be as inexpensive as possible while returning an adequate pension to the individual. It must be truly portable..."(13)

In brief, the program outlined in the summer of 1963 contained the following features:

- compulsory coverage for paid employees but voluntary for the self-employed since the latter would be contributing at twice the rate; the Armed forces and RCMP were to be excluded.

- funding would be on a pay-as-you-go basis. "It is possible...to construct a scheme which...is completely funded; but this would put in the hands of the state tremendous sums of money which would be withdrawn or used for other purposes."(14)

- contributions would be 2 per cent of earnings, split between employee and employer in the case of those employed, up to a ceiling of $4,000. "Average earnings in the country are approximately $4000 per year, and for this reason this figure has been chosen as the starting level."(15)

- pensions would be payable in full at age 70, or on a permanently reduced basis as early as age 65.

- there would be a transition period of 10 years before pensions reached their full rate, to allow existing employer-sponsored plans to adjust to the new program.

- after the transition period benefits would amount to 30 per cent of pensionable earnings at age 70, scaling down to 20 per cent at age 65.

- some years of low earnings could be dropped from the calculation of pensions, and contributions after age 65 could be substituted for prior low-earnings periods.

- earnings ceilings would be adjusted "with changes in the general level of wages and salaries".(16)

- surviving spouse benefits would be provided, without discrimination on the basis of sex, after age 65.

During the debate, the Minister of National Health and Welfare outlined some uncovered areas that might be dealt with:

"...ideally there would be provision in it for benefits to be paid at least to three classes of persons not now covered. There would be widows with dependent children; those contributors who, because they become disabled before reaching the age of 65 and no longer

have regular earnings are now covered only by assistance programs, and orphans of contributors."(17)

The minister noted that a constitutional amendment would be required to permit such changes, but gave no indication that the government intended to seek such an amendment.

The question of the method of funding drew criticism from the New Democratic Party:

> "The way the government's plan is worked out, with all its sophistry about leaving large areas to private plans and individual choice, means that large amounts of the people's savings will still be in private hands, in the hands of the insurance companies to be used for investment in ways in which they think fit rather than the people deciding through their government on how they should best be used."(18)

For the most part, though, formulation of the plan was a matter for federal-provincial rather than parliamentary debates.

Issues in Public Controversy

The federal-provincial conference of September 9 and 10, 1963, appointed a technical committee to find common ground between the proposed CPP and Ontario's mandated plan. By that time it was assumed that the federal proposals would have to be revised. Questions in the House of Commons elicited little information about the government's intention to proceed during the current session. In the meantime the public debate was escalating. At the end of July, the Great West Life Assurance Company had distributed a pamphlet, "Let's Raise a Storm," based on a speech of the president, which sought to prevent implementation of the proposed plan. In late October the Minister of National Health and Welfare advised Parliament that

> "We in my department have taken a box score....letters from individuals have run three to one in favour of the Canada pension plan. However, I must confess that from organizations such as insurance companies and trust companies almost the opposite ratio has been true."(19)

However she also noted that

> "...a well known actuarial firm in its monthly newsletter referred in glowing tones to the government's actuarial report, and it is a fact that not one solitary voice in this country has demonstrated in any way or even attempted to attack the actuarial basis of the pension plan as being incorrect or fraudulent."(20)

The combined efforts of the insurance and trust companies and the Chamber of Commerce elicited a counter-campaign in favour of the Canada Pension Plan by the Canadian Labour Congress. Bryden comments that: "the campaign undoubtedly helped to offset the insurance industry's efforts....By the time of the joint committee's hearings, even the Chamber of Commerce appeared ready to acquiesce in the inevitable."(21)

Throughout the autumn of 1963 various plan design options were being discussed, although policy direction remained generally consistent with the outline presented to Parliament during the summer. For example, the leader of the New Democratic Party asked on December 5 about an alleged federal offer to return half the funds to the provinces; the Prime Minister replied that it was not an offer but merely one of a number of methods of dividing the surplus in a contingency fund; it was still not intended that the plan be funded.(22) And on December 14 the Leader of the Opposition asked about a report emanating from the federal-provincial conference to the effect that Quebec was proposing a 4 per cent rather than a 2 per cent contribution rate as the price of its consent to a constitutional amendment. The Prime Minister answered that Quebec had not proposed 4 per cent for the Canada Pension Plan although that rate was suggested for Quebec's own plan; and since survivor benefits for persons under age 65 were not yet included, no constitutional amendment was needed.(23) However, on January 11, 1964 the Prime Minister wrote to the provincial premiers to outline a revised proposal that had resulted from their discussions. The Speech from the Throne opening the second session, February 18, included the following passage:

> "A measure will be placed before you to establish a comprehensive system of contributory pensions."(24)

Revised Proposals, 1964

Details of the revised plan were provided by the Prime Minister on February 20, 1964 during the Throne Speech Debate. The principal change was the federal government's acceptance of a higher earnings ceiling, resulting in an initial fund that would be available for provincial investment, coupled with a scaled-down benefit level so that pensions could be taken between ages 65 and 70 at a reduced rate - 20 rather than 25 per cent of average pensionable earnings. While the Prime Minister allowed that "our consultations with the provinces have led us to accept this revision as a reasonable one,"(25) on the basis that too high benefits over a short transition period might induce people to leave their private plans, he conceded that they were "less impressed" by criticisms of the Premier of Ontario that hinged on the 10-year transition period. Ontario was arguing for a longer transition before benefits became payable at their full rate, on the grounds that it would cause less disruption to the terms and provisions of existing plans. Quebec, for similar reasons, was also interested in a longer period - 20 years - in the case of its own plan. The Prime Minister commented:

"It is an important consideration, and I do not underestimate its importance. But it is also important that only about 30 per cent of the Canadians now at work are beneficiaries under existing plans. The urgent social need is surely to provide for the other 70 per cent, who are not now covered."(26)

In the end the federal government's view prevailed and a 10-year transition period was adopted for both the Canada and Quebec plans. Saskatchewan, meanwhile, had argued against the cut-back in benefits.

At the same time the matter of coverage was receiving attention; some bodies, prominent among them the Canadian Federation of Agriculture, were suggesting that the self-employed also ought to be included on a compulsory basis to ensure that they would have pension benefits to look forward to in old age. In the long term, this viewpoint prevailed, and the act that received Royal Assent not only mandated coverage for both paid employees and the self-employed but, as the result of an amendment at committee stage also included the RCMP and Armed Forces, hitherto excluded.

Bill C-75 and Provincial Response

The introduction of Bill C-75 on March 17, 1964 led straight into the debate on the revised proposal. Apart from the lower benefit level and higher earnings ceiling that resulted in a surplus available for provincial investment (particularly since the $10 per month increase in the flat-rate Old Age Security would not have to come from the CPP contributions), and a suggested dropout provision of 10 per cent of low-earnings months, there was little essential change from the proposals of the previous summer. However, two weeks later at the federal-provincial conference in Quebec City, the whole matter was put in doubt when Quebec outlined proposals for its own plan:

"The effect was electric. To most of the other provinces, Quebec's formulation seemed far superior to that of the federal government ....Quebec's plan made extensive provision for survivor, death, and disability benefits....Beyond providing these additional benefits, the Quebec formulation also provided higher maximum old age benefits than Ottawa's, less regressivity in the contribution structure, and substantially greater funding. The last feature attracted particular attention among the other provinces."(27)

When the conference ended on April 2 a major rift existed between the governments of Canada and Quebec largely on the basis of fiscal arrangements rather than the proposed pension plan, although Ontario announced its intention of looking to its own "standard" pension plan. The turmoil was not reflected in the resultant communique, which read in part:

"The federal proposals for the Canada pension plan were further discussed. The government of Quebec indicated that its proposed plan would be one which could provide portability of benefits with the Canada pension plan, and there was general agreement to ensure the widest possible pension coverage for Canadians."(28)

The apparent change of position by the Ontario Government became the subject of much discussion. In answer to many criticisms Premier Robarts in a speech on April 8, outlined his concern with the funds available to the province for investment if a national plan were introduced, adding:

"I have been accused many times of scuttling the Canada Pension Plan. I think it is now evident that I have not so intended, nor have I so done. I have tried for and fought for the best possible pension arrangements for the people of Ontario and at the same time have been aware of our responsibility as part of Canada."(29)

Behind-the-scenes efforts by officials of Quebec and the federal government allowed the Prime Minister to announce to provincial premiers on April 16, and to Parliament on April 20, that a solution had been found to the problems; and the terms of the two proposed plans would be dovetailed.(30) Also on April 20 the Premier of Ontario announced to the legislature that most of Ontario's concerns had been answered and that it was the government's intention to amend the Pension Benefits Act to remove Part IV dealing with mandatory plan provisions.(31) The amendment was duly passed on May 7. While there is no reason to assume that the two laws would have been incompatible or mutually exclusive, they had been widely regarded as such. At the same time, however, the Premier appeared to keep open the option of establishing a provincial plan parallel to the CPP, as Quebec intended.(32)

The result of the Canada-Quebec negotiations was a compromise, as can be seen from the chart at the end of this chapter.

- Canada, which had received other representations on the subject in any case, agreed to the Quebec proposal that coverage be mandatory for self-employed persons, although the RCMP and Armed Forces continued to be excluded.

- Middle ground was reached between the federal proposal for a total 2 per cent contribution on all earnings up to $4,500 and the Quebec proposal of a total 4 per cent contribution on earnings between a basic exemption of $1,000 and a maximum of $6,000. The solution was a combined 3.6 per cent rate between a basic $600 exemption ($800 for the self-employed) and a maximum of $5,000. Quebec agreed to allow contributions by persons over age 65.

- The benefit rate arrived at was the 25 per cent proposed by Quebec, up from 20 per cent in the federal proposal but halfway in the range of 20 per cent to 30 per cent originally proposed by Canada.

- Quebec's more inclusive survivor, death, and disability provisions were incorporated into the Canada plan, though this entailed provision of survivor benefits to disabled widowers only, a retreat from the sexual equality embodied in the original federal proposals.

- The federal proposal for dropping a set percentage of low-earnings months from the benefit calculation was accepted by Quebec in place of a sliding scale based on age.

- The federal proposal had been to escalate the earnings ceiling according to an "earnings index"; Quebec had proposed to escalate the earnings ceiling and benefits according to the Consumer Price Index with a minimum of 1 per cent and a maximum of 2 per cent. The solution was the development of the Pension Index, based on the Consumer Price Index, used to escalate benefits and (pending development of an Earnings Index) the earning's ceiling, starting in 1968 and both subject to the 2 per cent annual maximum.

- Both Canada and Quebec had proposed a retirement and earnings test between ages 65 and 70.

Funding Basis

The major structural change from the earlier federal proposals was in the move from a very low contributory rate under the original pay-as-you-go scheme to a rate high enough to create an initial surplus for provincial investment. While remaining essentially a pay-as-you-go plan, the CPP with its combination of higher contribution rate, higher earnings ceiling, lower benefit rate, and removal of the cost of the OAS increase now would accumulate an initial fund much larger than had been projected in the 1963 proposals. Under Bill C-75 Canada had offered one-half of the somewhat increased fund to the provinces for investment; Ontario had argued for 90 per cent on the basis that the remaining 10 per cent would be a fund of the same dimensions as the contingency fund under the original proposal. In the result, the federal government would hold only "the estimated amount required to pay benefits and administrative costs over a three-month period."(33) The remainder would be provided to each province in proportion to the contributions from that province, and any funds not borrowed by provinces would be invested in federal securities. This arrangement was the price of provincial participation in a nationally-administered plan.

Once accommodation had been reached between the Canada and Quebec plans the way was clear for parliamentary examination of the revised proposals. On June 18, 1964 Parliament was presented with the text of an address to Westminster amending Section 94A of the BNA Act,(34) which it approved. On August 10 a white paper was tabled,(35) followed by a revised motion introduced by the Minister of National Health and Welfare on October 28.(36) With the introduction of Bill C-136 on November 9, the debate began. The Bill received second reading on November 18 and was referred to a Joint Committee of the Commons and the Senate, empowered to hear witnesses and receive submissions.

Amending Formula

Bill C-136 contained one further provision that had not previously been mentioned - an amending formula whereby the federal legislation could be amended only with approval of two-thirds of the provinces having two-thirds of the affected population and requiring three years' notice of changes in contribution rates and benefit levels. The measure was incorporated principally at the insistence of Ontario who feared that Parliament otherwise might act against the interests of the provinces. The federal government, anxious to have the plan administered nationally, conceded the point; Parliament thereby allowed the provinces to exercise control over the legislation.(37) The concession in effect gave Ontario a veto since this province has a large enough population to deny the two-thirds approval even when all other provinces are agreed. Ontario has exercised its veto once, in the matter of the child-rearing dropout proposal.(38) The requirement of three years' notice for amendments has been waived, up to now, by unanimous consent of the provinces.

While the committee's deliberations lasted until February 1965, they produced only minor amendments to the bill as approved in principle. The government, as well as the Committee, proposed some amendments at the third reading stage, but only in three areas were changes incorporated:

- the RCMP and Armed Forces were included in coverage;

- provisions for orphans' benefits were extended to the children of disabled contributors;

- the committee had recommended an increase from 10 to 20 per cent in the low-earnings months to be dropped from benefit calculation. The government amended this to 15 per cent and it was approved in this form.(39)

Passage and Implementation

On March 29, 1965 Bill C-136 passed third reading and received Royal Assent on April 3 at the end of the parliamentary session. Con-

tributions began in January, 1966 using as a mechanism for deducting and recording earnings the Social Insurance Numbers that had been established for the Unemployment Insurance Commission. As can be seen from the record of the debates on CPP, the Social Insurance Numbers themselves received more attention than many other CPP provisions.

The Quebec Pension Plan became effective at the same time as the CPP. The first retirement pensions became payable in 1967, survivors' benefits in 1968, and disability pensions in 1970. Until 1973 the CPP remained unchanged.

THE RECENT PAST

The first indication of possible changes in the act came in the federal government's White Paper on Income Security at the end of 1970. One major proposal was for an increase in the earnings ceiling.(40) Because of the 2 per cent maximum escalation in the Pension Index, the Year's Maximum Pensionable Earnings (YMPE) figure was rising by only $100 per year. Both inflation and the general growth in wages and salaries had far outstripped the YMPE, which therefore no longer represented average earnings. The White Paper recommended new ceilings of $6,300 in 1973, $7,100 in 1974, and $7,800 in 1975; under the existing system the 1975 figure would have been only $5,800. Under the amending provisions of the CPP no remedy could take effect before 1973. The White Paper proposal was however, overtaken by events.

Unilateral QPP Changes

Quebec had long argued that the Government of Canada should vacate the welfare field in that province, including both universal and income-tested pensions. The failure to achieve agreement in matters of social security led to the rejection by Quebec of the constitutional amendment proposal at the Victoria conference in 1971. At the time Quebec was preparing a massive restructuring of social welfare programs in line with the Castonguay-Nepveu report on health and social welfare.(41) After the meetings in Victoria, Quebec amended the QPP to increase the maximum Pension Index escalation from 2 per cent to 3 per cent annually, raise the YMPE gradually from $5,600 to $6,300 by 1975, increase the flat-rate component for survivor and disability benefits, and liberalize the retirement test. From this point on the Canada and Quebec plans lacked the parallelism that had resulted from the 1964 compromise.

In the spring of 1973 the federal government tabled its "Working Paper on Social Security in Canada"(42) calling for a federal-provincial review of the patchwork quilt of social programs that had developed. In a section on the Canada Pension Plan, the working paper asked:

"(a) should the ceiling on the escalation of CPP pensions be removed or alternatively raised from 2 to 3 per cent as the Province of Quebec has done in the Quebec Pension Plan?

(b) should the year's maximum pensionable earnings...be increased, either in line with the Quebec increase...or to the levels proposed in the Government of Canada's 1970 White Paper?

"For its part the Government of Canada would favour full escalation of pension benefits, and the increase of the year's maximum pensionable earnings to $7,800 by 1975."(43)

CPP Amendments, 1973-1974

Agreement with the provinces was quickly reached on the most urgent amendments to be enacted, and the act amending the CPP received Royal Assent on December 12, 1973.(44) By unanimous agreement the waiting period was waived by the provinces so that the provisions could take effect at the beginning of 1974. The following changes were made:

- The 2 per cent ceiling on the Pension Index was removed, allowing benefits to escalate fully for increases in the Consumer Price Index.

- The calculation period for indexing was moved from the year ending June 30 to the year ending October 31, thereby making benefit adjustments (January of each year) more responsive to price increases.

- The YMPE was raised to $6,600 in 1974 and $7,400 in 1975, with a corresponding increase in the YBE to $700 ($900 for the self-employed).

- The flat-rate benefit component was escalated;

- The Pension Index limitation was removed for survivor and disability pensions.

QPP-CPP Co-ordination

At this time Quebec agreed to modify its plan in harmony, and once again the two plans were on the way to restoring their prior parallelism.

The second stage of the amendments followed a year later, with the act receiving Royal Assent on November 27, 1974.(45) This time the major provisions were as follows:

- The YMPE was escalated, beginning in 1976, by 12-1/2 per cent per annum until it reaches the Industrial Composite of wages and salaries; at that time it will be increased in line with that measurement.

- The YBE was lowered from 12 per cent of the YMPE to 10 per cent, and the higher minimum for the self-employed was eliminated.

- The retirement test was removed, making benefits payable between 65 and 70 without regard to outside earnings.

- Surviving spouse benefits were made available to men on the same basis as they were previously paid to women.

- Allowance was made for common-law marriages.

- Members of religious sects were permitted to elect not to contribute on self-employment earnings if their religion so required.

In their major thrust, the amendments reflected a society that had changed since the inception of the plan: wages had grown more rapidly than the YMPE, so that it no longer represented average earnings; women had entered the work-force in increasing numbers and were demanding equality of treatment in fringe benefits; and the earnings test for people retiring at the commonly accepted retirement age of 65 was no longer tolerable. Similar amendments were made to the Quebec Pension Plan, except that the retirement test was not removed until 1977. The major features of the QPP that differed from the CPP at this juncture (and remain today) were the higher flat-rate component of the benefit for survivors under 65 and disability pensioners, and a lower benefit for dependent children.

Recent Changes; Child-rearing Dropout Proposal

A final set of amendments to the legislation received Royal Assent on July 14, 1977.(46) Again, the three-year waiting period was waived by unanimous consent; but one provision of the legislation has not been proclaimed because the required approval by two-thirds of the provinces having two-thirds of the affected population was not forthcoming. The exception is the child-rearing dropout provision, under which persons leaving the labour force to care for their young children could drop certain years from the calculation of their eventual benefit. Ontario withheld consent, thereby effectively vetoing the measure - although British Columbia later reversed its position and voted against the proposal. Should Ontario reverse its position, the amendment could still take effect. Quebec incorporated a child-rearing dropout provision in its own plan; hence the CPP and QPP at present differ in a potentially significant respect.

Amendments approved by the provinces provided for: splitting of pension credits between spouses in the case of termination of marriage; a longer period of backdating pension payments in cases of late application; full children's benefits to each child regardless of family size (instead of half the regular rate for the fifth and additional children.)

Changes since the passage of the original Act in 1965, while moving the plan forward in line with changing conditions and attitudes, have not altered the plan's direction fundamentally. In fact, changes between the White Paper in 1963 and the final plan in 1966 were far greater than any changes since then.

Funding: Still an Issue

In one major aspect - funding - the CPP has yet to find its ultimate form. We have seen how the original intention of a pay-as-you-go plan with low contributions yielded to provincial pressure for a degree of funding as a source of low-cost investment funds. Decisions to be faced in the next few years centre on the type of plan desired and the mechanism for arriving at it. Some critics of the plan claim that it is going bankrupt and that the government is not aware of the problem. For example when the Auditor General of Canada made mention in his 1977 report(47) that the critical year for the CPP fund was approaching, there was a wave of anxious comment from the press and the pension industry. In fact, however, to foresee a funding "crisis" is to ignore the intentions of the framers of CPP, as explained in the original debate.

On more than one occasion the Minister of National Health and Welfare stated explicitly that, after some 10 to 20 years of operation, the CPP contribution level would have to be revised, regardless of the funding method:

> June 18, 1963 - "The relation of benefits to earnings will settle out in a way that makes it safe to estimate that for the first 10 years the contribution rate will not need to be more than 2 per cent of earnings."(48)
>
> March 17, 1964 - "This initial low rate will continue in force for 15 years, followed by a gradual increase over the years."(49)
>
> November 16, 1964 - "The combined contribution rate of 3.6 per cent...is proposed as a rate that can be expected to finance the plan for at least 20 years, without liquidating any of the investment reserve that will be built up meantime. All the actuary's estimates indicate...that some time after the plan is 20 years old there will be a need to reassess its finances. By that time experience of the plan will have made possible considerably more precise estimates of its costs. The range of population and

economic projections is too wide for it to be realistic to try to anticipate now what should be decided more than a generation hence. The timing of any change will, of course, depend in part on the views that are then taken about the desirability of continued partial funding and about many other points of economic policy." (50)

During debate on third reading of the bill, the Minister of National Revenue stated:

> "...at some stage, say in about 20 years, one may have to face a diminishing fund or the alternative of increasing the rates."(51)

Funding methods have figured in some subsequent discussions between the federal and provincial governments; Ontario's position was made public on April 1, 1976.(52) To date however, no decision has been reached. This Commission's studies on the subject may be found later in this volume, with its recommendations for future action.

NOTES

(1) Speech from the Throne, 1st Session, 26th Parliament, May 16, 1963. House of Commons Debates, p. 7.

(2) For a discussion of the political background to the formation of Canada's earnings-related scheme see Kenneth Bryden, Old Age Pensions and Policy-Making in Canada, Chapter 7, p. 137 ff.

(3) Ibid., p. 130.

(4) Ibid., p. 141.

(5) Ibid.

(6) Ontario indicated on April 6, 1962 that it had no objection to such an amendment.

(7) See "Letter to Provinces Respecting Pensions," appended to House of Commons Debates 1963, p. 1576: "The absence of vesting of employer contributions interferes with labour mobility. The lack of assurance that contributions are set aside for future retirement, when an employee leaves a firm, tends to weaken the effect of such schemes in making adequate provision for retirement benefits. The solvency of private pension plans also continues to be a concern."

(8) "An Act to provide for the extension, improvement and solvency of pension plans and for the portability of pension benefits," introduced March 19, 1963.

(9) The Ralliement des créditistes argued against "taxing" for pensions and would have expanded the universal flat-rate plan rather than creating a new one.

(10) House of Commons Debates 1963, p. 1419.

(11) Bryden, p. 149.

(12) Speech by the Minister of National Health and Welfare, House of Commons Debates 1963, p. 2340 ff.

(13) Ibid.

(14) Ibid.

(15) Ibid.

(16) Ibid.

(17) Ibid.

(18) Stanley Knowles (Winnipeg North Centre) in House of Commons Debates 1963, p. 2380.

(19) House of Commons Debates 1963, p. 4166.

(20) Ibid., p. 4164.

(21) Bryden, p. 162.

(22) House of Commons Debates 1963, p. 5444.

(23) Ibid., p. 5871.

(24) Speech from the Throne, Second Session, 26th Parliament, House of Commons Debates 1964, p. 3.

(25) House of Commons Debates 1964, p. 55ff.

(26) Ibid.

(27) Bryden, pp. 167-8.

(28) Communique of the Federal-Provincial Conference, Quebec City, March 31 - April 2, 1964. Appended to House of Commons Debates 1964, p. 1787.

(29) Premier of Ontario, Speech to the Canadian Club, Toronto, April 8, 1964, p. 11.

(30) See letter to the provincial premiers, April 16, 1964; appended to House of Commons Debates 1964, p. 2388.

(31) Debates of the Legislature of Ontario, 1964 pp. 2222, 2224.

(32) See for example Bryden, p. 174.

(33) Canada Pension Plan: Report for the year ending March 31, 1976, p. 11.

(34) "Address Requesting Amendment to Provide for Survivors' and Disability Benefits." House of Commons Debates 1964, p. 4435. The revised text read as follows: "The parliament of Canada may make laws in relation to old age pensions and supplementary benefits, including survivors, and disability benefits irrespective of age, but no such law shall affect the operation of any law present or future of a provincial legislature in relation to any such matter."

(35) House of Commons Debates 1964, p. 6579.

(36) Ibid., p. 9507. The new wording of the motion read: "That it is expedient to introduce a measure, to be known as the Canada Pension Plan, to establish in Canada a comprehensive program of retirement pensions payable to contributors; to provide for the payment of supplementary benefits, including benefits for the widows and orphans of contributors and benefits to contributors who become disabled; to provide for the co-ordination of pensions payable under the Old Age Security Act with benefits payable under the Canada Pension Plan and for the payment of adjusted pensions under the Old Age Security Act beginning at any age from 65 years; to provide for the adjustment of pensions and other benefits in line with increases in earnings and the cost of living; to provide that funds arising from the operation of the Canada Pension Plan shall be invested in securities of the provinces, provincially guaranteed securities of provincial crown agents, and securities of Canada; and to provide further that all expenditures under the Canada Pension Plan, including cost of administration, shall be

financed from contributions by employees and employers and from contributions by persons in respect of self-employed earnings."

(37) See House of Commons Debates 1964, p. 10133. Also see Globe and Mail editorial, "Notes from the Overlord," July 15, 1977, criticizing the federal government for amending its own legislation in the face of Ontario's veto; and reply by the Hon. Marc Lalonde, Globe and Mail, July 20, 1977.

(38) The matter is discussed in a background paper.

(39) For a discussion of the background to this amendment see "A Report to the Honourable Marc Lalonde, Minister of National Health and Welfare from the Canada Pension Plan Advisory Committee on Categorical Drop-out under CPP for Child-Rearing," May 1977, p. 3 ff.

(40) There was also a proposal to increase the flat-rate component for survivor and disability benefits. The White Paper was tabled on November 30, 1970.

(41) Commission of Inquiry on Health and Social Welfare, Quebec Offical Publisher, 1971.

(42) The paper was tabled on April 18, 1973.

(43) The Hon. Marc Lalonde, "Working Paper on Social Security in Canada," Department of National Health and Welfare, Ottawa, p. 27.

(44) An Act to amend the Canada Pension Plan, (No. 2), S.C. 1973-74, c. 41.

(45) An Act to amend the Canada Pension Plan, S.C. 1974-75-76, c. 4.

(46) An Act to amend the Canada Pension Plan, S.C. 1976-77, c. 36.

(47) Report of the Auditor General of Canada to the House of Commons, for the fiscal year ended March 31, 1977, p. 228, para. 17.6.

(48) House of Commons Debates 1963, p. 2340 ff.

(49) House of Commons Debates 1964, p. 1161 ff.

(50) Ibid., p. 10119 ff.

(51) House of Commons Debates 1965, p. 11919.

(52) The Hon. W. Darcy McKeough, "Review of Issues in Financing the Canada Pension Plan," Ministry of Treasury, Economics and Intergovernmental Affairs, Toronto, April 1976. See also Geoffrey N. Calvert, Pensions and Survival - The Coming Crisis of Money and Retirement, A Financial Post Book, p. 95.

February 1958	Government of Canada commissioned Professor R.M. Clark to study the Canadian and U.S. public pension systems.
January 17, 1962	Prime Minister sought provincial agreement for an amendment to Section 94A of the British North America Act to allow inclusion of survivor benefits in a contributory, wage-related pension plan. Quebec withheld approval.
April 6, 1962	Pension Benefits Act introduced in Ontario, "for study and discussion only."
March 19, 1963	"An Act to provide for the extension, improvement and solvency of pension plans and for the portability of pension benefits" introduced in Ontario. Passed April 26, 1963.
May 16, 1963	Speech from the Throne, 1st Session of the 26th Parliament announced "a comprehensive system of contributory pensions."
May 21, 1963	Premier of Quebec revealed that the province was considering legislation similar to Ontario's, on portable pensions.
June 21, 1963	Minister of National Health and Welfare introduced a resolution in the House of Commons on the Canada Pension Plan. Motion agreed to.
	Prime Minister wrote to provincial premiers, enclosing the resolution and suggesting a federal-provincial conference to deal with pensions.
July 18, 1963	Minister of National Health and Welfare tabled White Paper; debated by Committee of the whole House.
July 26, 27, 1963	Federal-provincial conference discussed pensions.
September 9, 10, 1963	Further federal-provincial conference established a technical committee to find common ground between the proposed Canada Pension Plan and Ontario's Pension Benefits Act, which mandated provincially-portable pensions for employers with 15 or more employees.

January 11, 1964	Prime Minister wrote to premiers to outline revised proposal.
February 18, 1964	Speech from the Throne, Second Session, promised legislation "to establish a comprehensive system of contributory pensions." Prime Minister outlined amended form during Throne Speech debate, February 20. Ontario expressed some concern with new measure.
March 11, 1964	Minister of National Health and Welfare reintroduced a motion dealing with the pension plan, and debate opened March 17 (Bill C-75).
March 31-April 2, 1964	Federal-provincial conference in Quebec City, where the Quebec government outlined proposals for its plan which would be portable with the Canada Pension Plan.
April 16, 1964	Prime Minister wrote to premiers to announce that it had been possible to reconcile the Canada and Quebec plans.
April 20, 1964	Prime Minister tabled his letter to the provinces. Premier of Ontario announced that most of Ontario's concerns had been answered, and his government therefore would amend the Pension Benefits Act to remove the mandatory pension plan provisions. This amendment was passed on May 7.
June 18, 1964	Parliament approved a joint address to Westminster to amend Section 94A of the British North America Act to allow for the provision of survivors' and disability benefits in federal legislation.
August 10 1964	Minister of National Health and Welfare tabled a further White Paper on the Canada Pension Plan.
October 28, 1964	Amended motion by Minister of National Health and Welfare, reflecting discussions with the provinces.
November 9, 1964	Bill C-136 introduced. Received second reading on November 18; referred to joint committee.
February 22, 1965	Debate on third reading of C-136 as amended by the joint committee.
March 1965	Provincial agreement received for constitutional amendment.

March 29, 1965	Bill C-136 passed; received Royal Assent April 3, 1965.
January 1966	CPP and QPP contributions began.
January 1967	First retirement pensions payable.
February 1968	First survivors' benefits payable.
February 1970	First disability benefits payable.
December 1973	Pension Index ceiling removed; benefits would rise in January of each year for full increases in the Consumer Price Index. YMPE raised to $6,600 for 1974 and $7,400 for 1975. Increase in flat-rate component.
November 1974	YMPE for 1976 and later to escalate at 12.5 per cent per year until it reaches the Average Industrial Wage. Basic exemption (YBE) reduced to 10 per cent of YMPE from 12 per cent. YBE for self-employed same as for employees. Retirement and earnings test removed: full benefits payable from age 65. Sex discrimination in ancillary benefits removed: spouses and children of female contributors treated the same as those of male contributors. Common-law marriage recognized. Members of certain religious sects permitted to opt out if self-employed.
July 1977	Credit splitting upon termination of marriage introduced. Dropout provision approved but not proclaimed. Limitation on orphans' benefit for fifth and later children repealed.

TABLE OF PROVISIONS AND AMENDMENTS (Part 1)
Canada Pension Plan: Highlights of Development, 1963 to 1965, and Current Provisions

	White Paper July 18, 1963	Bill C-75 March 17, 1964	Quebec Proposals March - April, 1964
Coverage	Compulsory for employees; voluntary for self-employed. RCMP and armed forces excluded.	No change.	Compulsory for employees and self-employed earning over basic amount.
Funding method	Pay-as-you-go; minimal contributions.	Higher contributions ceiling creating initial surplus fund; half to be available for provincial investment.	Contribution rate twice the Ottawa figure, creating much larger initial surplus fund; all monies for Quebec investment.
Contribution rate	1% employee, 1% employer up to earnings ceiling.	No change.	2% of earnings between basic amount and ceiling.
Earnings limits	No basic level; maximum $4,000 per year subject to annual adjustment in line with wages and salaries.	No basic level; maximum $4,500 per year subject to adjustment after 5 years for earnings index.	Basic level $1,000; maximum $6,000 for two years, then adjusted to Consumer Price Index.
Retirement age	70; permanently reduced pension 65-69. Contributions permitted after age 65.	70; retirement test 65-69 (age reducing progressively from 70). Contributions permitted after age 65.	70; retirement test 65-69. No contributions after age 65.
Rate of benefit	30% average adjusted earnings at age 70, down to 20% at age 65.	20% average adjusted earnings.	25% average adjusted earnings.
Ancillary benefits	Surviving spouse pension at age 65 (male and female).	No change.	Survivor, death, and disability benefits.
Dropout provision	Low earnings years (unspecified number); substitute years after 65 for prior low-earnings years.	10% of total months; substitute earnings after 65 for prior low-earnings periods.	Ascending scale based on age.
Indexing of benefits	None.	None.	Adjusted periodically to Consumer Price Index 1% minimum, 2% maximum.

TABLE OF PROVISIONS AND AMENDMENTS (Part 2)
Canada Pension Plan: Highlights of Development, 1963 to 1965, and Current Provisions

	Bill C-136 November 9, 1964	Royal Assent April 3, 1965	Current Provisions (1979)
Coverage	Compulsory for employees and self-employed earning over a certain basic amount. RCMP and armed forces excluded.	Same, but amended to include RCMP and armed forces.	Same, but self-employed members of religious sects permitted to opt out.
Funding method	Compromise in contribution rate creates larger fund than originally planned; major portion available for provincial investment.	No change.	No change.
Contribution rate	1.8% employee, 1.8% employer; 3.6% self-employed between basic amount and ceiling.	No change.	No change.
Earnings limits	Basic level $600 (employees) $800 (self-employed); maximum $5,000 per year adjusted to pension index from 1968 on; 2% maximum.	No change.	Basic level same for all contributors; linked to maximum. Maximum escalating at 12-1/2% annually (1976 and later) to AIW level, then in line with AIW. No "cap" on annual escalation.
Retirement age	70; retirement test 65-69 (age reducing progressively from 70). Contributions permitted after age 65.	No change.	No change.
Rate of benefit	25% average adjusted earnings.	No change.	No change.
Ancillary benefits	Survivor, death, and disability benefits; pensions to widows and disabled widowers based on age, presence of children. Orphans' benefits reduced for 5th and additional children.	Same, but amended to provide benefits to disabled contributors' children	Benefit structure unchanged; now available to survivors of female plan members on same basis as males. Same benefit payable to all children regardless of number.
Dropout provision	10% of total months; substitute earnings after 65 for prior low-earnings periods.	15% of total months; substitute earnings after 65 for prior low-earnings periods.	Same; (categorical drop-out for child-raising enacted but not proclaimed since Ontario and B.C. have not agreed to the amendment.)
Indexing of benefits	Annual adjustment to pension index - 2% maxmimum.	No change.	Annual, full Consumer Price Index.

Chapter 2

Summary of Plan Features

Canada Pension Plan benefits are earnings-related, are payable as monthly retirement pensions at age 65, and are based on required contributions of employees, employers, and the self-employed. Benefits are also provided for disabled contributors, surviving spouses, and dependent children; and a lump-sum benefit is payable on the death of a contributor. All monthly benefits are adjusted annually according to increases in the Consumer Price Index.

Pension credits under the plan are fully portable throughout the individual's working life, and are updated to reflect increases in general wage and salary levels.

A CPP contributor retiring in 1979 could receive a pension of up to $218.06 a month, depending on average earnings. A disability pensioner could receive a maximum of $216.06, and a surviving widow or widower up to $134.28. The dependent child of a disabled or deceased contributor was entitled to a flat-rate monthly benefit of $52.51. The maximum death benefit in 1979 was a one-time payment of $1,170.

While any province may elect to establish its own earnings-related pension plan, only Quebec has done so. Terms of the Canada and Quebec plans are similar, however, and full portability between them is maintained. Benefits under both plans are payable anywhere in the world.

Coverage is virtually universal for members of the work-force between ages 18 and 65, and extends to those over 65 but under 70 who defer their retirement. Generally, all employees, employers, and self-employed persons are required to make regular contributions on all eligible earnings - through payroll deductions where possible, otherwise through the income tax mechanism.(1)

Eligible earnings are defined as all income from employment or self-employment above a specified minimum and up to a specified maximum. For 1979 the basic exemption (YBE) was $1,100 and the earnings maximum (YMPE) $11,700, so that a person's eligible earnings could be as high as $10,600. Contribution rates (unchanged since the CPP was instituted) are 1.8 per cent for employees and an equal amount from their employers, and 3.6 per cent for the self-employed. Thus, for individuals with earnings at or above the YMPE in 1979, contributions on an annual basis amounted to $190.80, or $381.60 if self-employed.

Portability is ensured through the central recording of all contributions in individual accounts. In effect, a single contribution is sufficient to entitle a person to an eventual retirement benefit. Vesting is immediate since no minimum period of service or continuity of employment in a particular location or occupation is required. Portability is further enhanced through the operation of an updating formula at the time benefits are calculated, so that pension credits once earned retain their value in relation to the rising levels of wages and salaries.

Retirement pensions are equal to 25 per cent of pensionable earnings (all earnings up to the YMPE, disregarding the basic exemption) averaged over the number of months the individual could have contributed, that is, from January 1966 or the person's 18th birthday if later. Before the 25 per cent is applied, however, both earnings and contributory months are subject to adjustment - first, to restate the individuals's earnings in terms of current wage levels, and second, to eliminate from averaging certain months of low earnings.

Pensionable earnings for each month of the person's contributions are updated by means of a ratio of the average YMPE for the latest three years (including the year the pension is to commence) to the YMPE in effect at the time of the contributions. Thus, for example, a person whose earnings had been consistently at 75 per cent of the YMPE could expect a pension equal to 75 per cent of the maximum benefit in the year of retirement. The YMPE, it should be noted, is intended to represent an average of industrial earnings. At present it is somewhat lower, and for that reason is increased by 12-1/2 per cent annually; eventually it will be escalated according to increases in average wages and salaries as measured by Statistics Canada (the "Industrial Composite").(2)

Contributory months may be adjusted in three ways. First, the person's contributory period is automatically reduced by any months for which a CPP disability pension was payable. Then contribution months before age 65 may be dropped out according to the number of contribution months after that age. Finally, the remaining months may be reduced by 15 per cent, provided that the balance used in averaging must be at least 120 months.(3) This last "dropout" allowance, which may be as much as seven years, recognizes as a normal characteristic of careers various breaks in work-force activity associated with education,

retraining, illnesses, unemployment, and child-bearing. (A specific allowance for years of child-rearing has been enacted but not yet proclaimed, as discussed in Chapter 8).

Transitional aspects of the CPP during its first ten years of operation affected the retirement rights and benefit amounts of many members of the present over-65 population. First, the eligibility age for retirement originally was 68, reducing to age 65 by 1970. More important to the present discussion, however, is the fact that retirement pensions commencing before 1976 were effectively reduced in all cases. Because they were averaged over a minimum of 120 months, no one could receive full credit for pensionable earnings until contributions had been made for at least 120 months; that point could be reached at the earliest by someone who had contributed regularly from January 1966 through December 1975. Those who chose to take a retirement pension during this transition period (or who reached age 70 and had no choice) received fractional pensions: one-tenth of the full amount if one year's contributions had been made, five-tenths after five years, and so on. No such reduction, however, was applicable to disability, survivor, or dependent children's benefits, although these benefits required contributions for a minimum of from three to five years, and so were not payable in the early years of the plan. The phasing-in of various benefits, especially the retirement pension, was complete by January of 1976; at that time the plan was said to have "matured."

Surviving spouses' pensions are pertinent to a consideration of elderly person's incomes, since many spouses in the present over-65 population, especially women, will have little or no CPP entitlement in their own right. Eligibility for a surviving spouse's pension depends on contributions for ten years, or for one-third of the years in which contributions could have been made, subject to a minimum of three years. The benefit for a survivor between ages 45 and 65 is a flat-rate amount ($52.51 in 1979) plus 37.5 per cent of the amount of retirement pension the contributor would have received if age 65 had been attained. The same amount applies while a survivor under age 45 has dependent children or is disabled; otherwise there is a reduction of 1/120 for each month the survivor was under 45 at the time of the contributor's death. No benefit, except for the lump-sum death benefit which applies in any case, is payable if the surviving spouse is under age 35 and is neither disabled nor has dependent children; but a full benefit may be payable in the event of subsequent disability. Each child, while a dependent, is entitled to a monthly benefit equal to the flat-rate portion of other ancillary benefits: $52.51 in 1979. The maximum monthly pension for a surviving spouse under 65 was $134.28 in 1979 (not counting children's benefits).

Survivors aged 65 or over receive a somewhat lower amount, normally 60 per cent of the deceased person's retirement pension. If the survivor has a CPP pension in his or her own right, however, a combined pension may be payable up to a total equal to the applicable maximum

retirement pension, $218.06 in 1979. Assuming no personal retirement pension, the maximum payable in 1979 to a surviving spouse aged 65 and over was $130.84.

Division of pension credits or "credit-splitting" is a relatively new feature of the CPP. On termination of a marriage in 1978 and later, either spouse may apply within three years for an equal division of CPP credits earned by both persons during the period of the marriage.(4) The process includes disclosure to both parties of "pensionable earnings" credited to them before and after the division, and a thirty-day period during which the applicant may withdraw if he or she wishes to do so. Where such a division is made, one spouse will usually have gained a measure of CPP protection for such contingencies as disability, death, and retirement.

Other CPP features include disability pensions and death benefits, both described elsewhere. All benefits are treated as income for tax purposes, and are considered to be "other income" in determining the amount of benefits under income-tested programs - Guaranteed Income Supplement, Spouse's Allowance, and GAINS.

Issues have arisen over some aspects of the benefit features of the plan. These are discussed in Chapter 8.

Table 1
CPP Statistics

1. Number of Recipients in Ontario, June 1979

Retirement benefits	347,113
Disability pensions	42,711
Children's benefits - under 18	14,448
- 18 and over	3,416
Lump-sum death benefit	2,042
Surviving spouse pension	95,176
Orphan's benefits - under 18	38,193
- 18 and over	10,668
Combined pensions	14,384
Total	568,151

2. Amount of New Benefits Payable in Ontario, June 1979

	Maximum	Ontario Average
Retirement benefits	$ 218.06	$159.97
Disability pensions	216.06	182.88
Children's benefits	52.51	52.51
Lump-sum death benefit	1,170.00	926.92
Surviving spouse pension	134.28	112.39
Orphan's benefits	52.51	52.51
Combined pensions	218.06	151.62

3. Benefit Payments in Ontario, June 1979, ($'000)

Retirement pensions	$40,233.3
Disability pensions	8,444.6
Children's benefits - under 18	924.9
- 18 and over	246.7
Lump-sum death benefits	1,892.8
Surviving spouse pension	10,945.8
Orphan's benefits - under 18	2,097.9
- 18 and over	656.4
Combined pensions	2,150.4
Total	67,592.7

4. Benefits as Per cent of GNP (Fiscal year ending March 31, 1978)
   Canada - .48 per cent Ontario - .26 per cent
5. Benefits as Per cent of Federal Expenditures (Fiscal year ending March 31, 1978)
   Canada - 2.3 per cent Ontario - 1.3 per cent
6. Contributions (1978-79)
   Canada - $2.1 billion Ontario - not available
7. Individual Maximum Contribution (1979)
   Employee - $190.80 Self-employed - $381.60
8. Earnings Ceiling; Basic Exemption (1979)
   YMPE - $11,700 YBE - $1,100

Source Canada Pension Plan, Statistical Bulletin, Special Edition 1979; additional data from Department of National Health and Welfare, Department of Finance.

NOTES

(1) Certain individuals may be excluded because of religious convictions against joining such a plan. They may rejoin after opting out, but once back in the option to leave again is no longer applicable.

(2) Based on data provided by Statistics Canada: monthly averages of weekly industrial composite wages and salaries, 1978 (including preliminary figures for November and December). Average weekly wages and salaries: $265.38; annual average: $13,799.76; 1978 YMPE was $10,400.

(3) Applicable to persons retiring in January, 1976 and later. For retirements during the transition period (1967 through 1975) benefits were effectively reduced by the requirement that "basic contributory months" must total at least 120. Thus, a person who has contributed throughout 1966 and retired in January, 1967 would have been entitled to 12/120 of the 25 per cent, or 2.5 per cent of pensionable earnings.

(4) Section 53.2 of the Canada Pension Plan Act (S.C. 1976-77, c. 36, s.7) reads:

> "An application in writing to the Minister may be made by or on behalf of either former spouse to a marriage or his estate or such person as may be prescribed by regulation within 36 months of the date of a decree absolute of divorce or of a judgment of nullity of the marriage, granted or rendered on or after January 1, 1978, for a division of the unadjusted pensionable earnings of the former spouse."

Chapter 3

Demography

Demography attempts to identify population trends and make projections for the future, based on a statistical study of births, deaths, and migration. Only time can verify demographic projections; but they must be made if successive generations are to plan intelligently for the future. Just how uncertain that future can be is illustrated by the following extract from Leonard Marsh's report, written in 1943, on social security for Canada:

> "The indications are that if the birth rate continues to decline and our working-population deficiency is not supplemented by immigration, the result will be fewer and fewer people of working age being obliged to carry, in one way or another, the burden of support for more and more persons who have passed the span of useful employment. The problem is not therefore one that can be disregarded or tossed lightly aside. Even if we do nothing at all, the fact will still face us that thirty years from now our old age pension bill will be approximately twice what it is to-day."(1)

In 1943, the author would have rejected out of hand the possibility of a baby boom in the proportions experienced by Canada after 1945.

Until the advent of government programs redistributing income to the aged (the 1927 Old Age Pensions Act was the first) the make-up of the population was not a concern to the public purse. The aged in general were expected to die before retirement or to provide for themselves or be provided for by their children in their later years. As it happened, Canada was a growing country whose birth rate produced a year-by-year increase in the population. The total fertility rate exploded after 1945 to an average high of 3 per cent and then in the 1960s the birth rate began to decline, to a rate at which today the population is no longer replacing itself. Now Canada is faced with the

questions: Will the birth rate follow the pattern of the European industrialized countries and leave us with an aging population? What will be the effect of an aging population on Canada's social security programs?

Geoffrey Calvert in "Pensions and Survival" (1977) drew a gloomy picture for Canada's social security based on the effects of a continuing decline in the birth rate:

> "...one can watch the tidal wave of today's young people entering the work-force, sweeping up through it, and then entering the retirement ages, radically changing the whole balance between young and old, and between workers and pensioners at each stage of their forward surge through the age groups.(2)
>
> "The source of our concern does not stem only from the swollen cohorts of population now entering the work-force, but equally from the shrunken cohorts that will follow them up through the age groups. It is this shrunken generation, also with us today and as yet unborn, that will have to carry the burden of pensions for their more numerous parents and elders, and to face the prospect of tax burdens that would almost certainly be rejected in short order by today's voters."(3)

Calvert's warning has been taken up by the media and has been applied primarily to the future of the Canada Pension Plan. The possible effects on the Old Age Security (OAS) and Guaranteed Income Supplement (GIS) programs also discussed by Calvert have been largely ignored, but they are also important in considering the total cost of social security in the future.

This Royal Commission was charged to "study the impact on the economy of different systems of financing retirement pension plans and arrangements including Ontario's financing and investment role in the Canada Pension Plan."

To obtain a proper perspective of Ontario's role in the Canada Pension Plan it was necessary to look at the interrelation of the CPP with other government programs providing retirement income. Canada's "social security" for the elderly (which we may define as a provision of income in old age, guaranteed or made available by government) is made up of OAS, GIS, Spouse's Allowance, and in Ontario, GAINS, all paid for out of general taxes, and by the Canada Pension Plan, paid for out of payroll taxes shared by employee and employer. All of the plans ultimately rely on the authority of government for their financial security. If the funding arrangements for the CPP are of concern, the financial arrangements of the OAS, GIS, and SA are of no less concern. Therefore when we consider questions of intergenerational inequities and the effect of the baby boom on the CPP we must also consider the OAS, GIS, and Spouse's Allowance and their costs in the future. To determine

these costs it is necessary to estimate what Canada's population and its composition is likely to be between now and the middle of the next century.

POPULATION PROJECTIONS

All projections into the future, whether gloomy or optimistic, are nothing more than guesses based on the likelihood that the future will either mirror the past or diverge from it. The further ahead the projection, the less likely is it to be correct as it moves further away from those conditions, past and present, which affect the future. Caution must therefore be used at all times, and especially for periods more than twenty years away. Projections seventy years into the future (2050) are given merely to show possible trends after the time when the last children of the baby boom have completed the life cycle.

In 1972 the fertility rates for Canada fell below those required to replace the existing population. The population projections from which Calvert drew his conclusions were based on a continuing decline in fertility rates. To test the validity of Calvert's prognosis it was therefore necessary to examine the reasons for assuming this continuing decline and then to look at all the factors affecting population projections. Statistics Canada had also made long-term population projections based on a declining birth rate.

Ultimately the Commission decided to make its own projections. A comparison with the Commission's results and those of Statistics Canada is given in a resource study included in this volume. It illustrates the very different results that arise from differences in assumptions. The accuracy of demographic projections is crucial for social security planning.

Table 1
Projected Population for Canada, Selected Years(a)

	Royal Commission		Statistics Canada			
			Projection I		Projection II	
	Total population	65 and over	Total population	65 and over	Total population	65 and over
	(Thousands)		(Thousands)			
2000	31,596	3,384				
2001			28,251	3,358	29,758	3,358
2030	38,930	6,712				
2031			28,837	6,406	33,727	6,406
2050	42,126	7,458				
2051			26,090	5,993	33,737	6,241

a Figures are for different years because of the initial starting years selected by the Commission and Statistics Canada.

Source Royal Commission on the Status of Pensions in Ontario. Statistics Canada, Social Security National Programs, 1978, Cat. 86-201.

The key variables in any population projections are fertility, immigration/emigration, and mortality. Careful consideration was given to each of these by the Commission because the population projections provide the base for all its work related to the Canada Pension Plan, and the future costs of other government programs, including the GAINS program. We examine each of these variables in turn.

Fertility

Fertility(4) dropped below the level of zero population growth for the first time in Canada's history in 1972.(5) Discounting the post-war baby boom of 1945-1965, this drop is in line with the long-term decline in fertility which characterizes most Western countries. In planning for social security the question to be answered is whether Canada (and Ontario) can expect any significant short-term fluctuation in fertility in the near future which will alter the population size and distribution from long-term expectations over the next 70 years. Most commentators have assumed a continuing decline. Daniel Kubat, sociologist to the Commission, represents a school of thought which forecasts a slight upturn in fertility rates over the next two decades, with a return to zero growth by the year 1995. Dr. Kubat based his conclusion on the following observations:

1. Women in the age group 25 to 29 have exceeded women aged 20 to 24 in Age Specific Fertility, beginning in 1970. This points to a postponement rather than to a cessation of childbearing. Figures in Table 2 illustrate the trends for Ontario:

Table 2
Age Specific Fertility Rates for Women 20-24 and 25-29, Ontario, 1966-1976

Year	20 - 24	25 - 29
1966	171.3	160.2
1967	162.7	151.2
1968	155.2	148.8
1969	152.9	152.5
1970	148.5	152.2
1971	137.2	145.9
1972	122.2	138.6
1973	119.8	132.2
1974	114.6	129.4
1975	112.3	128.3
1976	105.6	124.6

Source Statistics Canada, "Vital Statistics, Volume I, Births 1975 and 1976," Cat. 84-204, Table 6, p. 18.

2. The 1976 Census shows the female population in Ontario by age group, as follows:(6)

10-14	389,475
15-19	395,325
20-24	376,095
25-29	359,460

Thus the greater numbers in the younger cohorts will result in more children in absolute terms being born even if the rate of reproduction remains the same. This is the so-called baby boom "echo." However if the present trend of delayed child-bearing continues, it is likely to prevail until about 1990 and will result in more births in the meantime than earlier specific fertility rates would have forecast.

3. There is some indication that the present younger generations are returning to more traditional values than those which prevailed in the 1960s and early 1970s. This could signal a renewed interest in the family. Peer group pressure is an important factor in the lives of the young, and any renewed interest in child-raising could have a snowballing effect because of the size of the age groups concerned.

4. History does not offer any examples of sustained zero growth except as a consequence of dramatic fluctuations in mortality which wiped out substantial populations from time to time. Fertility will fluctuate around a net replacement ratio of 1 and is more likely to be above unity than below it.

Some relief from the continued downward trend in fertility is foreseen by the Commission on Declining School Enrolment in Ontario. In his letter of transmittal to the Minister of Education the chairman offered the following view:

> "My best guess, however, and it cannot be more than an informed guess, is that we will experience some relief from the decline in elementary school enrolment from the mid 1980s to the early 1990s and in secondary school enrolment from the mid 1990s onwards for a number of years."(7)

A recent article in Scientific American deals with fertility in the developed countries and accepts the view of a continued downward trend because of social and economic factors which are changing the nature of marriage and fertility.(8) In examining the historical downward trend in fertility, the author admits that some projections of extremely low rates may be too compacted in time frame and, as a consequence, the patterns now being predicted by some for the 1980s and 1990s may be delayed by a few decades.

The author, arguing that we are in a society permanently changed from the old patterns of fertility, lists such contributing factors as

a) a change from the perception of children as a source of future income in an agrarian society, to the perception of them as a financial burden in the industrial and post-industrial world;

b) a decline in traditional and religious authority and an increase in emphasis on the individual;

c) universal education of both sexes and an improvement towards equality in the status of women with men;

d) higher survival rate of children;

e) a consumer society slanted toward the gratification of the individual;

f) development and diffusion of reliable methods of birth control.

He adds:

> "The important thing about this catalogue of social changes is that the changes all seem to be irreversible and that some of them, particularly those linked with the status of women, have not yet run their full course."(9)

The Commission is not persuaded that all of the social changes listed are irreversible, as the author suggests. Future changes in our society to be brought about by energy supply problems promise to be far-reaching. Adaptation may bring with it new social outlooks which could also change attitudes towards child-bearing. After considering the arguments the Commission decided to adopt Dr. Kubat's position of a slight upswing in fertility rates in the near term as its most probable assumption for its projections. However, for comparison purposes, a range of fertility assumptions was also selected which included a declining fertility rate. The four scenarios are:

Low-Low - the scenario popular at present sees a continuation of current low net reproduction rates (0.90) to the year 2000 and beyond.

Low - a continuation of the current rate rising slightly to 1.0 in 1985 and continuing at that rate thereafter.

Most Probable - a slight increase from current rates to 1.2 in 1985, dropping to 1.1 in 1990, 1.0 in 1995 and continuing unchanged thereafter.

High - an increase from current rates to 1.45 in 1985, dropping to 1.3 in 1990, 1.15 in 1995, 1.0 in 2000 and continuing unchanged thereafter.

Immigration

Numbers of immigrants and their age and sex distribution can have important effects on Canada's future population. The Commission's projection for international immigration were based on actual experience from 1971 to 1977 inclusive, as shown in Table 3.

Table 3
International Immigration to Canada and Ontario, 1971-1977

	Canada	Ontario	Immigration to Ontario as a share of total
			(Per cent)
1971	121,900	64,357	52.8
1972	122,006	63,805	52.3
1973	184,200	103,187	56.0
1974	218,465	120,115	55.0
1975	187,881	98,471	52.4
1976	149,429	72,031	48.2
1977	114,914	56,594	49.2

Source Department of Manpower and Immigration, Ottawa, Immigration Statistics.

The Commission assumed for its projections 100,000 immigrants to Canada in 1978, escalated by 1/2 of 1 per cent per year to the year 2000 after which it remains constant. For interprovincial migration, the Commission assumed that Ontario would receive a constant 50 per cent of the international immigration.

Emigration figures are more difficult to ascertain and have been estimated from figures showing immigration to the United States from Canada. The Commission has assumed an annual figure of 40,000 emigrants, 40 per cent of whom are assumed to come from Ontario. These figures, too, are escalated by 1/2 of 1 per cent per year to the year 2000 and remain constant thereafter. For Ontario the net figures resulting from these assumptions were:

1978 net immigration of 60,000
2000 net immigration of 66,960.

An important factor in immigration figures is the age composition of those coming into a country (or province); that is, the proportion of old and young dependents and hence the proportion likely to enter the work-force upon arrival. Until changes in the Immigration Act (1976) there were three classes of admissible immigrants: independent, those

with good employment prospects; sponsored relatives, the immediate family; and nominated relatives, who needed to meet only some of the criteria for independent immigrants in order to gain admission. It has been argued that the last group was largely responsible for the numbers of recent arrivals who had difficulty obtaining work and as a consequence fell back on public support programs.

Changes introduced in 1976 allowed the Minister of Immigration for the first time to set numerical targets for immigration each year. The category of nominated relatives has been dropped. The legislation also allows for inflows of refugees from time to time, stemming from extraordinary circumstances elsewhere. It is likely, therefore, that reunification of families will be an important part of the immigration picture for the coming decade; subsequently however, the needs of the work-force will be the underlying reason for admission and it can be expected that independent persons who can fit directly into the labour force will constitute the major part of the entrants.

Historical tables(10) show that around 50 per cent of all immigrants in any year between 1946 and 1974 could be classified as workers - coming from the independent and nominated classes of immigrants. However the percentage dropped to 43 in 1975 and 41 in 1976, the latter being a year of unprecedented immigration from Lebanon following the civil war. Future patterns should be expected to show similar variations in the proportion of dependent and independent immigrants whenever groups are admitted for humanitarian reasons.

The Commission has made no assumption about the proportion of independent and dependent immigrants, but age and sex breakouts are projected for migrants in Table 4 based on Statistics Canada figures for immigrants(11), and on U.S. information about persons immigrating from Canada, for emigrants. Ratios between the age groups and the sexes are assumed to remain constant throughout the period of the projections.

Table 4
Immigrants and Emigrants by Age Group and Sex, Canada, Projected

	Immigrants		Emigrants	
	Male	Female	Male	Female
	(Per cent)			
Under 20	15.7	15.4	17.6	18.1
20 - 64	33.2	33.2	29.2	32.9
65 and over	0.9	1.6	0.9	1.2
Total	49.9	50.1	47.8	52.2

Source Prepared for the Royal Commission on the Status of Pensions in Ontario by Daniel Kubat, from data from Department of Manpower and Immigration and Statistics Canada.

These projections, therefore, allow for a larger proportion of independent immigrants who can move directly into the work-force, and a decreased proportion of dependents (under age 20, and 65 and over), though still allowing for family reunification and extraordinary influxes on humanitarian grounds.

While the mortality and fertility experience of newcomers is often vastly different in their country of origin, it is found that they quickly adopt the values of the new society. Therefore we cannot expect them to have a crucial impact on the birth rate of the Canadian population. In addition, Canada's immigration screening is such that good health is a criterion for entry, and persons coming to this country tend to be better-off financially and better educated than their countrymen at home. These factors have been shown to correlate positively(12) with lower fertility. As a consequence we should not expect immigration to distort fertility patterns and therefore the general projections for the Canadian population.

There is also little reason to expect that the increasing participation in the labour force of women in Canada will not be matched by immigrant women; indeed one might argue that they are more likely to take jobs than their Canadian counterparts.

The implications of the amended Immigration Act among other factors, coupled with experience in recent years, has led this Commission to assumptions about population movements which produce figures somewhat below those in other current major works.

Mortality

The final factor to be considered in outlining our future population is how long these newborns and recent arrivals as well as the present population will live. For this factor we assumed changes in mortality experience to continue through to the year 2050. The initial population used was that of the 1971 Census, adjusted to allow for the Census undercount, and the mortality rates applied to this population were those of the Life Table 1970-72 for Canada, published by Statistics Canada. Mortality rates were then developed through to the year 2050.

The Commission felt that available Canadian work on mortality projections either covered too short a period or was based on some rather arbitrary assumptions that it was not prepared to accept. Consequently, the methodology used for the Commission's projections is based on work done by the Office of the Actuary for the U.S. Social Security Administration, in Actuarial Study No. 77.(13) In this study death rates by age group and sex were calculated for ten cause of death groupings. The assumed changes in experience for each cause were combined to provide an average change (increase or reduction) in mortality by age and sex. These averages were then applied to the 1971 population figures and projected forward to the year 2050.

The Commission has assumed there will be no major breakthrough in medicine which might alter the experience over the period in question. Other underlying assumptions in some of the cause of death groupings are as follows:

- Diseases of the heart and vascular diseases: moderate improvement is expected for both sexes, continuing the recent trend;

- Malignant neoplasms (cancer): moderate improvement is assumed; heightened public awareness of the disease leading to earlier diagnosis and treatment could result in deaths occurring at a later age even if the rate of death remained unchanged;

- Suicide, homicide, accidents: the death rate from motor vehicle accidents has already decreased; however in Canada suicides are increasing for both sexes. Some overall increase is expected in violent deaths for males;

- Respiratory diseases: some improvement is assumed;

- Diabetes, cirrhosis: assume no change.

It is well known that changes in lifestyle affect health, and that the impact on the sexes can vary. Female mortality experience, in the Commission's assumptions, is expected to improve faster than male, in spite of factors such as diet, ceasing smoking, exercise, and the use of seatbelts, all of which have tended to reduce male mortality in recent years.

The Commission's projected life expectancy figures show that by the year 2050 men are still not expected to reach the rate already attained by women. Projected figures for Canada are assumed to apply to Ontario, and comparisons are shown in Table 5 between actual experience in 1971 and 1976, and the Commission's expected rates in 2050.

Table 5
Life Expectancy by Sex, Canada and Ontario, 1971, 1976, 2050

	1971		1976		2050
	Canada	Ontario	Canada	Ontario	Canada and Ontario
	(Years)				
At birth					
Male	69.3	69.6	70.19	70.55	73.1
Female	76.4	76.8	77.48	77.66	81.2
At age 60					
Male	17.0	16.6	17.23	17.01	-
Female	21.4	21.5	21.96	21.88	-
At age 65					
Male	13.7	n/a	13.95	13.71	16.0
Female	17.5	n/a	18.0	17.92	20.7

Source Statistics Canada, Vital Statistics, Volume III, Deaths 1976, Cat. 84-206, and data prepared for the Royal Commission on the Status of Pensions in Ontario.

Figures for the expected mortality rates per 1,000 population exposed are shown in Table 6 which compares experience in the 1970-72 Life Table for Canada with the projections prepared for the Commission. Rates calculated for Canada are assumed to apply to Ontario.

Table 6
Mortality Rates by Sex, Canada and Ontario, 1971 and 2050

	1971		2050	
	Male	Female	Male	Female
	(Deaths per 1,000 population)			
At birth	20.02	15.44	10.05	7.76
At 1 year	1.29	1.15	.80	.64
At 20 years	1.78	.56	1.89	.44
At 40 years	2.91	1.73	2.40	1.19
At 50 years	7.61	4.03	5.69	2.75
At 60 years	19.71	9.32	14.59	7.12
At 70 years	44.36	23.37	32.51	15.58

Source Department of Insurance, Ottawa. Canada Pension Plan: Statutory Actuarial Report No. 6, as at December 31, 1977, Schedule 3, p. 41.

The projected reduction in mortality at birth has, to a certain extent, already been achieved. The combined male-female rate in 1971 was 17.5 per thousand; by 1976 this had dropped to 12.3.(14) From Table 6 the projected increase in violent deaths for young males can be seen at age 20, where the rate per 1,000 is expected to increase slightly over time. From age 50 onward the gap in mortality between the sexes becomes more pronounced.

Conclusion

Comparison of census figures for 1971 and 1976 confirms that Canada's population is aging, and in the process the trend to increased survivorship of women can already be perceived. Of crucial importance to our assessment therefore is the number of children we expect to be born, and the time of their birth. As they work their way through the pattern of dependence - production - dependence they will have a tremendous impact on the extent of the burden to be carried by the taxpayers.

By combining the projections outlined for fertility, migration and mortality, we estimated the numbers and the composition of the population of Canada and of Ontario over the coming 70 years. Results for selected years for Canada are set out in Table 7. Complete projections including those for Ontario are in Appendix A to this volume.

Table 7
Actual and Projected Population for Canada, 1970-2050, Selected Years

	0 - 19	20 - 64	65 - 90 and over	Total
		(Thousands)		
1970				
Male	4,415	5,716	774	10,905
Female	4,235	5,618	943	10,796
Total	8,650	11,334	1,717	21,701
2000				
Male	5,124	9,172	1,411	15,707
Female	4,860	9,056	1,973	15,889
Total	9,984	18,228	3,384	31,596
2010				
Male	4,900	10,454	1,667	17,021
Female	4,646	10,342	2,306	17,294
Total	9,546	20,796	3,973	34,315
2020				
Male	5,280	10,751	2,258	18,289
Female	5,004	10,587	3,100	18,691
Total	10,284	21,338	5,358	36,980
2030				
Male	5,398	10,954	2,822	19,174
Female	5,115	10,751	3,890	19,756
Total	10,513	21,705	6,712	38,930
2050				
Male	5,713	11,873	3,116	20,702
Female	5,413	11,669	4,342	21,424
Total	11,126	23,542	7,458	42,126

Source Projections prepared for the Royal Commission on the Status of Pensions in Ontario, based on the Commission's most probable fertility and immigration assumptions.

From Table 7 it will be noted that in the year 2000 the total female population exceeds the total male population for the first time. This trend continues to 2050 and reflects the increasing proportion of females in the 65 and over group. This fact has significance for the approach government might take in considering retirement income for women, both in and out of the work-force. The significance of the make-up of the various age groupings in the population projected is considered in the next chapter.

NOTES

(1) Leonard Marsh, Report on Social Security for Canada, Toronto, 1943.

(2) Geoffrey N. Calvert, Pensions and Survival, Toronto, 1977 p. 16.

(3) Ibid., p. 18.

(4) Definitions of usual fertility terms:

A. Zero Population Growth: each female born reproduces one female; this equals a net reproduction rate of 1.

B. Net Reproduction Rate (NRR): the probable number of female children each female will have during her lifetime.

C. Gross Reproduction Rate (GRR): the probable number of female children each female will have during her lifetime provided she survives the child-bearing years. (Because of this assumption the GRR is always greater than the NRR.)

D. Total Fertility: the probable number of children a woman will have provided she survives to the child-bearing years.

E. Age-Specific Fertility: the probability that a woman of a particular age group will have a baby within one year. The normal age groups used are 15-19, 20-24,...45-49, and fertility is assumed to be zero outside these ages.

(5) Statistics Canada, Vital Statistics, Volume I, 1974, Cat. 84-204.

(6) Statistics Canada, 1976 Census of Canada, Cat. 92-824, Vol. 2.

(7) Letter to the Hon. Bette Stephenson, M.D., Minister of Education from R.W.B. Jackson, Commissioner, dated October 31, 1978, p. iv.

(8) Charles F. Westoff, "Marriage and Fertility in the Developed Countries," in Scientific American, December 1978, Vol. 239, Number 6, p. 51.

(9) See Volume V, Resource Study, "Methodology and Assumptions," Table 1.

(10) See migration tables in Daniel Kubat, "The Demography of Older Canadians." in Volume IX.

(11) K.S. Guanasekaran, "Analytical and Technical Memorandum No. 6: Migration Projections for Canada."

(12) For example, see discussion in "Opportunity for Choice - A Goal for Women in Canada," Gail C.A. Cook, ed., Statistics Canada in association with the C.D. Howe Research Institute, pp. 37ff.

(13) U.S. Social Security Administration, Actuarial Study No. 77 - United States Population Projections of OASDHI Cost Estimates.

(14) Figures supplied by Department of National Health and Welfare, Ottawa, Health Services and Promotion Branch.

LIST OF TABLES

Table 1 - Projected Population for Canada, Selected Years 33
Table 2 - Age Specific Fertility Rates for Women 20-24 and 25-29, Ontario, 1966-1976 34
Table 3 - International Immigration to Canada and Ontario, 1971-1977 37
Table 4 - Immigrants and Emigrants by Age Group and Sex, Canada, Projected 38
Table 5 - Life Expectancy by Sex, Canada and Ontario, 1971, 1976, 2050 40
Table 6 - Mortality Rates by Sex, Canada and Ontario, 1971 and 2050 41
Table 7 - Actual and Projected Population for Canada, 1970-2050, Selected Years 42

Chapter 4

Dependency Ratios

Dependency ratios represent the extent to which part of a country's population at a given time is not engaged in economically productive activity. The unproductive population relies on the productive part to provide it with the goods and services it needs for existence. Traditionally, the young and the old are considered unproductive. Since economic wealth is finite, consisting of the goods and services produced each year, the share of the wealth transferred to the unproductive diminishes the share for the productive. If the unproductive part of the population increases, then by the theory the share of goods and services for the productive part of the population decreases. The relative sizes of the productive and unproductive parts of the population can be important therefore both at any point in time and as trends over time.

Birth rates, mortality rates, education patterns, retirement patterns, and savings rates will all be important factors in determining dependency ratios and the significance of those ratios for government social policy in the future.

The Commission analyzed its population projections on the basis of customary groupings of the population age 0-19, the young dependents; age 20-64, the productive part; and age 65-90 and over, the old dependents. Dependency ratios were then calculated for the projected population based on the percentage of the young dependents to the productive part, the percentage of the old dependents to the productive part, and the total dependents to the productive part. Table 1 shows the results.

Table 1
Population Dependency Ratios for Canada, 1970-2050

	Total population	0-19 as percentage of 20-64	65-69 and over as percentage of 20-64	Total dependency as percentage of 20-64
	(Thousands)		(Per cent)	
1970	21,701	76.3	15.2	91.5
1980	24,872	57.6	15.6	73.2
2000	31,596	54.8	18.6	73.3
2010	34,315	45.9	19.1	65.0
2020	36,980	48.2	25.1	73.0
2030	38,930	48.4	30.9	79.4
2050	42,126	47.3	31.7	78.9

Source Projections prepared for the Royal Commission on the Status of Pensions in Ontario based on the Commission's most probable fertility assumptions. See Appendix A for population projections and Appendix B for Dependency Ratios.

Some interesting relationships should be noted:

- the total dependency ratio in 1970, 91.5 per cent, was higher than it is projected to be at any other time over the next 70 years - each worker was responsible for himself and nearly one other person.

- the total dependency ratio declines markedly between 1970 and 1980, from 91.5 per cent to 73.2 per cent. All of the decrease is in the young dependent ratio. The baby boom population has moved into the 20-64 age grouping.

- the young dependency ratio continues to decline gradually to 2010. After 2010 the young dependents increase somewhat, reflecting an increase in absolute births from the baby boom "echo." After 2030 the downward trend resumes.

- the old dependency ratio increases over the whole period, doubling by 2050 but with the largest increases taking place only after 2010 and up to 2030, the period during which the baby boom population will enter the old dependency group.

Much comment has been heard about the increasing burden old people will put on society by the beginning of the century and in particular on the young workers of that generation. The dependency ratio has been pointed to repeatedly to support the premise that the burden will be so great that younger workers will revolt and refuse to pay for the old.

From the Commission's projections we see that the total dependency ratio is actually at its lowest point in 2010 and that a substantial

upturn is evident only in 2020. The government has therefore over 30 years of lead time before the feared revolt is likely to come. This is not to say that nothing should be done for 30 years but rather that it is not already too late to take action to relieve the pressure on the working population.

In 1970 the country shouldered a total dependency ratio of 91.5 per cent without comment. What then is the difference between 1970 and, say, 2020 when the total dependency ratio is projected at 73 per cent?

Clearly the answer to that question lies in the respective cost for young dependents and old dependents.

EFFECTIVE DEPENDENCY

"Per capita costs of supporting old and young dependents are not necessarily equal. To obtain a more accurate picture of dependency, the number of old and young should be weighted by their respective per capita support costs. In this way a measure of effective dependency is obtained."(1)

The Ontario Treasury, working with a study prepared in 1976 by the Federal Treasury Board Secretariat, estimated that per capita expenditures for government health, education, and social welfare programs for the aged was two and one-half times the per capita expenditures for the young. Although the Commission has not tested the validity of the figures, it was prepared to accept the idea of "effective dependency" because it agreed that public costs for the old were likely more than for the young. However, if age dependency is weighted against youth dependency in the proportion of 2.5 to 1 and applied to ratios in Table 1, we have nearly the same long-term results for effective dependency as we found in the dependency trends shown in Table 1. The total cost relationship will continue to be less than that borne in 1970 until after the year 2020. Only in 2030 does the total cost relationship exceed that for 1970, and by 2050 there is only a slight increase in the total cost relationship over that in 2030.

The validity of these relationships as projected depends first on whether the ratio of 2.5 accurately represents the dependency cost of the old in relation to that of the young. If, for example, there were a marked improvement in the health of the old so that health costs for that segment of the population declined, the total cost burden would diminish, and there would be a shift in the cost relationship between young and old dependents. A similar change might result if costly institutional care for the old were replaced by less expensive home care. If institutional day care for the young were expanded, the cost relationship might shift from old to young. The total cost of dependency could decrease. Improved survivorship rates would increase the numbers of those aged 65 and over. However, improved survivorship

indicates better health which in turn could mean greater participation in the work-force in the older age groups, and a shift of the older cohorts out of the old dependency grouping. Perhaps only the old old (those over 75) eventually will be considered dependent.(2)

Table 2
Effective Dependency Cost Relationships

	Youth cost share Dependency ratio	Age cost share 2.5 x dependency ratio	Total cost ratio
		(Per cent)	
1970	76.3	38.0	114.3
1980	57.6	39.0	96.6
2000	54.8	46.5	101.3
2010	45.9	47.8	93.7
2020	48.2	62.8	111.0
2030	48.4	77.3	125.7
2050	47.3	79.2	126.5

Source The Royal Commission on the Status of Pensions in Ontario, based on dependency ratios in Table 1.

A second element in measuring the validity of the dependency ratio is the relationship of total dependency cost to the total productivity of the society. Therefore, the key to measuring the burden of dependency cost is the real growth rate of the Canadian economy. Increased costs due to population changes can be supported more easily if the economy is strong. If each worker is producing more in real terms (not inflated dollar terms) a certain level of benefits from government programs will take a smaller proportion of the economy's available output. In this connection, pensions under the CPP increase with real growth until retirement since they are tied to a wage index. After retirement they increase with a price index, as do the OAS and GIS, and not with productivity. Hence, government programs for the old will be less of a burden on future generations if we have real economic growth.

To estimate some cost implications of the projected age dependency ratios the Commission undertook a projection of the cost of Old Age Security in the future. Assumptions included the following:

- OAS at its present basic level, increasing only with prices;
- the Commission's most probable economic assumptions for inflation;
- real growth in earnings of 2 per cent a year.

The results were determined in absolute dollars, as a percentage of Gross National Product and as a percentage of CPP/QPP Contributory

Earnings. Complete results are shown in Appendix F. Table 3 shows OAS costs as a share of GNP, the most significant of the three measurements.

Table 3
Old Age Security Expenditures with Full Indexing to the Consumer Price Index as a Percentage of Gross National Product

	Percentage of GNP
1979	1.72
1980	1.71
1990	1.59
2000	1.38
2010	1.17
2020	1.27
2030	1.28
2040	.99
2050	.88

Source The Royal Commission on the Status of Pensions in Ontario. See Appendix F-1.

From these figures we see a similar pattern emerging for costs in relation to GNP as for dependency ratios:

- a steady fall until about 2010;
- a more stable pattern for the 20 years between 2010 and 2030 (though with an increase in cost resulting from the baby boom which is not reflected in the dependency ratios per se);
- a continuing reduction after 2030.

The comparative reduction in expenditures as a percentage of GNP reflects the fact that the benefits are indexed only to prices, and thus increase more slowly than per capita GNP which includes real growth (in excess of prices) of about 2 per cent a year. This factor outweighs the increasing proportion of the population that is 65 and over, except for the period 2010 to 2030 during which the baby boom group reaches retirement age. An even larger comparative cost reduction can be seen for the Guaranteed Income Supplement and Spouse's Allowance, in the comparison set out in Appendix F-4. Similar trends are projected for Ontario in Appendices F-3 and F-6.

VALIDITY OF DEMOGRAPHIC CONCERNS

The concern expressed by Leonard Marsh in the 1940s over an increasing elderly population to be supported by government programs

was perfectly valid from his point in time. He could not predict the post-war baby boom or the economic growth of the country.

The scenario outlined by Geoffrey Calvert for the long-term impact of the baby boom may be equally valid at this time; but the Commission is of the opinion that projections of the population into the future, especially over a period of 70 to 90 years, can at best only point to possibilities which policymakers should consider when making decisions. The Commission affirms the need to design programs now which take cognizance of possible conditions in, say, 30 years' time, with allowance for reconsideration as factors change.

Some of the variables which will affect our demographic future, especially as it relates to pension planning, must not be ignored:

Fertility and Mortality Rates

The baby boom cohorts do not begin to enter retirement till about 2010. An upswing in fertility as late as 1990 could provide sufficient young workers to offset the greater number in the older cohorts. Who can now accurately predict the social patterns of fertility and family creation in 1990? Lower fertility rates or maintenance of present rates are not the only possibilities. The Commission is attracted to the possibility of an upswing of fertility rates in the middle and late 1980s. On the other hand a major medical breakthrough such as a cure for cancer would lead to much longer life expectancies and hence to increased pension cost. Even with known mortality rates we have seen in our projections that women will exceed the number of men in absolute numbers by 1980.(3) The effect of longer life expectancies in the future will therefore have increasing importance for overall retirement income costs. On the other hand, a healthier population at older ages coupled with more flexible retirement ages may mean that people will work for longer periods. In that event there may be reduced costs for pensions and more workers to support the dependent population.

Immigration

Control of immigration has been used from the early part of this century to deal with short-run deficiencies in the population structure. Who can say now what exigencies, such as the expected shortage of skilled labour in the 1980s, will be met in this way? Type and age of immigrants and their social patterns, will have an impact on the existing population and on the population of the future. Disruptions elsewhere in the world, such as the plight of the "boat people," followed by unexpected immigration, can affect the population structure in ways we cannot begin to predict.

Dependency Ratios

Dependency ratios assume that all members of certain age groupings are dependent. A change in retirement ages can increase or decrease dependency for the older group. If mandatory retirement age is abolished, who can say how many in the younger group will become dependent later because of lack of job opportunities? If the trend of increasing work participation for women changes, how will this affect utilization of GIS and also the growth in GNP?

Real Growth

What will be the real economic growth of Canada in the future? Will it be such that the expected dependency ratios will be easily carried, or will it be so slow that even a lesser dependency ratio will seem intolerable? This is the key question for the future. No discussion of the dependency burden is meaningful without assessment of Canada's long-range prospects for real growth.

Government Programs

Will the share of government expenditures on the aged increase as a result of political pressures, or will government programs be less important in relation to the total provided for retirement income from all sources? It is to this question the Commission believes serious consideration must be given now. Retirement income provision by nature is a long-term matter; due consideration must be given to a system that is reasonably adaptable to future developments. The Commission's approach is to provide some degree of flexibility in retirement income design.

SUMMARY

In conclusion, the Commission agrees that proper weight should be given to Canada's possible demographic future; but it finds itself in agreement with the following statement in a paper prepared for the National Symposium on Aging held in 1978:

> "The policy issues related to meeting the needs of the elderly population in Canada today, and those that will arise in the future with the expected increase in both the number and the proportion of the population who are elderly, have been the cause of some considerable and increasing debate during the last couple of years. However, in terms of the economic implications of policy regarding the aged, the discussion has often been marred by confusion and unnecessary alarm.
>
> "The primary reason for this appears to have been the tendency to compress conceptually, within short time horizons, the deep

structural changes which are taking place in the economy, as well as frequently to exaggerate the behavioural adjustments that individuals make to institutional changes. For instance, alarmist points of view have recently been expressed regarding the potential impact of demographic changes on the economy and its institutions. It is not always understood that economic processes often unfold very slowly; indeed, many of the perceived problems frequently discussed these days may not take place until two decades into the next century. Furthermore, major forces may yet be unleashed in the future to alter completely any projections which we would make today on the basis of past trends and estimated behavioural impacts. Thus, it is not easy to make a calm, rational evaluation of many of the existing or expected changes in the economy, particularly as they relate to the aged at any point in time or to the aging of society in general."(4)

The specific effects of demographic projections on the Canada Pension Plan will be dealt with in detail in the section on the CPP funding.

NOTES

(1) This is the approach taken in a paper entitled, "Some Demographic and Economic Aspects of Canada's Aging Population," prepared by the Ministry of Treasury, Economics and Intergovernmental Affairs, Taxation and Fiscal Policy Branch, 1978. The discussion on "effective dependency" is drawn from this paper.

(2) See Daniel Kubat, "The Demography of Older Canadians," in Volume IX.

(3) See Appendix A-1 and A-2.

(4) Brian J. Powell and James K. Martin, Economic Implications of an Aging Society in Canada, Ottawa, 1978.

LIST OF TABLES

Table 1 - Population Dependency Ratios for Canada, 1970-2050 46
Table 2 - Effective Dependency Cost Relationships 48
Table 3 - Old Age Security Expenditures with Full Indexing to the Consumer Price Index as a Percentage of Gross National Product 49

Chapter 5

Funding the Canada Pension Plan

WHAT IS FUNDING?

Money to pay pension promises has to come from somewhere. When it is set aside in advance of the time pension benefits are payable, that process is "funding" for benefits to be paid sometime in the future.

Pay-As-You-Go

If pension benefits are paid as they fall due without any assets being accumulated, the plan is said to be operating on a pay-as-you-go (or "pay-go") basis.

Full Funding

In a funded plan, money is set aside with a third party to provide for future benefits. If at any point in time the assets accumulated are sufficient to pay all accrued benefits as they fall due, the plan is said to be "fully funded." To the extent that not all accrued benefits can be paid at a particular point in time the plan is only "partially funded." Various patterns of "funding," or deciding how much must be put in the fund now to pay benefits later, have been developed. To the extent that a fund is built up, interest on that fund is available to pay a portion of the benefits, and so reduce the direct cost.

FUNDING AND SOCIAL SECURITY PROGRAMS

Social security programs generally are financed on a pay-as-you-go basis. The rationale is that a government-sponsored program relies ultimately on the ability of government to raise the necessary money by taxation. Old Age Security and the Guaranteed Income Supplement are

operated on this basis, as are other forms of social assistance and family benefits. Old Age Security originally was paid out of a fund provided by earmarked taxes, but this arrangement was dropped in 1975. Payroll deductions for the Canada Pension Plan are in effect a form of taxation from a specific group.

Private sector employment pension plan design, on the other hand, requires a fund for two main reasons:

a) to ensure that assets will be available out of which to pay benefits regardless of the continuing existence or solvency of the employer;

b) to ensure orderly financing so that costs will not become unmanageable as the plan matures or the composition of the covered group changes. This provides equity between different generations of plan members and helps an employer to price his products realistically; it facilitates recognition of the cost of plan amendments which increase benefits or liberalize the conditions for receiving them.

In a social security program it is assumed that the plan will continue in perpetuity, since the plan is backed by the taxing power of the government. The creation of a fund for the reasons in a) above is generally considered unnecessary. The argument against a fund is carried further when it is pointed out that creating a fund which is invested in government bonds affords no greater security than an unfunded plan, because the reliability of government bonds is likewise rooted in the taxing power of the government. It might be possible to externalize the liability for the assets in a fund if the assets were invested in equities or were lent abroad, but these options have other political and economic connotations which might make them unacceptable to the public.

The second reason for funding, the control and spreading of future costs, may however be justified for government programs, so that the cost burden of the plan can be levelled over the years and over different age cohorts of workers. Without some mechanism for smoothing in a completely pay-as-you-go plan, costs will continue to rise as more and more people become entitled to benefits from the plan.

It is with the pay-as-you-go approach that the structure of the population becomes particularly important. So long as there are sufficient young workers coming into the plan stream to meet the costs of the payments out to the retiring workers without undue burden, the plan can operate smoothly.

FUNDING OF THE CANADA PENSION PLAN

Unlike Old Age Security, the Canada Pension Plan is now operating on a partially funded basis. A contribution rate originally set above the pay-go rate created an excess of contributions over current benefits, resulting in the buildup of a fund which in 1978 stood at $14.3 billion.

Funding Patterns

Under the terms of the CPP its position is analyzed in Statutory Actuarial Reports prepared by the Federal Department of Insurance. One purpose of these reports is to provide information about the funded status of the plan and the need to change contribution rates based on three different plan funding patterns, which are designated in the reports as Funds A, B, and C. These patterns may be described as follows:

Fund A

Phase 1 The present contribution rate of 3.6 per cent of contributory earnings exceeds payment of benefits and expenses. The excess constitutes a fund which is lent to the participating provinces. The investment earnings, being interest payable by the provinces, is likewise lent to the provinces. This phase is completed when current benefits and expenses are greater than current contributions.

Phase 2 Current benefits and expenses are paid from current contributions plus that part of the interest on the fund required to make up the difference to pay benefits. To the extent interest is not required to meet the payments, the fund will continue to grow. When the funds available to the provinces for new loans drop below the amount the provinces must pay for interest to meet current benefit costs, the cash flow to the provinces becomes negative and Phase 2 is completed.

Phase 3 When current benefits and expenses exceed current contributions plus the current interest on the fund, the provinces must repay their loans to meet current costs. Phase 3 is completed when the fund is exhausted.

When Phase 3 is completed, either the contribution rate must rise to the pay-go cost, or other sources of funds have to be found to meet current costs.

Fund B

Phase 1 Same as for Fund A.

Phase 2 Instead of the cash flow to the provinces becoming negative, the contribution rate rises to the then pay-go rate to pay for current benefits and expenses and continues to rise in the future as required. In the result, interest payable by the provinces continues to be loaned to them, and the fund continues to increase by the amount of these new loans. Interest is never used to pay benefits.

Fund C

Phase 1 Same as Fund A.

Phase 2 Same as Fund A.

Phase 3 The contribution rate rises to the then pay-go rate to pay for current benefits and expenses, and continues to rise in the future as required. In the result, the fund remains at the level attained at the end of Phase 2, and the loans to the provinces are never in fact repaid. Although interest is used to pay benefits and expenses, in real terms the fund and interest payments become less and less significant.(1)

With these funding patterns the question to be resolved is, "how soon and at what pace should the contribution rate begin to rise to its ultimate level?"(2) In coming to grips with this question the timing of the various phases in the development of the CPP funding pattern have become known as "critical years." These critical years coincide with the phases discussed under Fund A. From a policy point of view it is important that a decision be made on the future financing of the CPP before the end of the Phase 1 of Fund A is reached, i.e., before the first critical year. Statutory Actuarial Report No. 6 fixes this year at 1985. The earlier report dealing with this projection, Statutory Actuarial Report No. 3, fixed the first critical year at 1982, while the original projection fixed the first critical year at 1981.

Full Funding Issue

From the description of these funds we can describe the CPP at the present time as being partially funded. If any of the patterns described are adopted, the CPP will gradually move closer to a pay-go system. However whether pay-go is the correct funding method for the CPP has become the centre of keen debate. This debate intensified with the release of a working paper entitled, "Review of Issues in Financing the Canada Pension Plan" by the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs in April 1976. In challenging this paper, Geoffrey Calvert in Pensions and Survival(3) comments that decisions for financing the CPP are "one of the major decisions of the decade in Canadian finance." According to Calvert, the choice of funding method will have the most far-reaching impact on:

- Federal-provincial relations;

- Provincial spending and borrowing arrangements;

- Present and future CPP tax rates;

- Individual equity and windfalls from the CPP;

- Intergenerational subsidies between people;

- The capital markets;

- Private enterprise.

"It would therefore be a good thing if Canadians were to become somewhat familiar with the options that lie open, and to get some sense of what is quietly buried in the equally inviting looking, though statistically dry presentations of Funds A, B and C."(4)

THE COMMISSION'S PROJECTIONS FOR THE CANADA PENSION PLAN

The seriousness of the decisions to be made persuaded the Commission of the need for a complete actuarial examination of the existing plan status as well as exploratory work on a number of possible approaches.

The most current CPP statutory actuarial report at the time the Commission started its investigation was the third, as at December 31, 1973. The economic assumptions of this report for 1976 and later were as follows:

Annual increase in average earnings, 5.5 per cent;

Annual increase in the Consumer Price Index, 3.0 per cent;

Annual rate of interest on new investments, 6.5 per cent.(5)

Comparing these with more recent developments, it appeared to the Commission that it should carefully consider the assumptions on which its own work should be based, while recognizing that all assumptions take into account long-term trends rather than short-term movements. The Commission consulted a number of experts in the various fields in which assumptions were to be made, and determined a set of assumptions upon which its actuarial work for all phases of the report is based. This provides a consistency throughout the report which the Commission felt was important since it sees all phases of retirement income provision as parts of a whole. The bases for the selection of various assumptions are set out in the Methodology section of this Volume.

Three alternative sets of economic assumptions and four sets of fertility assumptions were used in many of the projections to give some idea of the sensitivity of the results to different possibilities, alone and in combination.

The Commission's Fertility Assumptions

Table 1
The Commission's Fertility Assumptions(6)

Year	Net reproduction rates			
	Low/low	Low	Most probable	High
1971-74	Actual rates from Statistics Canada.			
1975-84	Rates determined linearly by interpolation from 1974 and 1985 values.			
1985	.90	1.00	1.20	1.45
1990	.90	1.00	1.10	1.30
1995	.90	1.00	1.00	1.15
2000 and later	.90	1.00	1.00	1.00

Source The Royal Commission on the Status of Pensions in Ontario, Volume V, Resource Study, "Methodology and Assumptions."

The Commission's "most probable" assumption is less pessimistic than those adopted by many today. It reflects both a baby boom echo (births produced by the baby boom cohorts) and the perception that some of the present low fertility may arise from postponed child-bearing rather than no child-bearing. These concepts are discussed in the Resource Study, "Methodology and Assumptions," in this volume, and in greater detail in Volume IX in the papers prepared by Daniel Kubat, Sociologist to the Commission. It must be remembered that the fertility assumptions are important for forecasting the future working population. The absolute numbers in the retirement cohorts between now and 2030 have already been born.

By contrast to the Commission's most probable fertility assumption, the Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977, uses a net replacement ratio of 1 throughout for its main projections and .9 for its auxiliary projections. The latter represents the low fertility assumption used by Statistics Canada for its "Population Projections for Canada and the Provinces 1972-2001." The Commission's work in its range of assumptions therefore includes both these fertility forecasts for comparison purposes.

As we noted in the chapter on Demography, population projections take into account both fertility and net immigration. Recent changes in the Immigration Act will affect the type and age distribution of immigrants, and this in itself will have interesting effects on the number of additional workers in the work-force and on additional births.(7)

There is no indication that these changes were taken into account in the Statutory Actuarial Report 1977 assumptions.(8)

The Commission's Economic Assumptions

Key assumptions for any projections for the Canada Pension Plan are the economic assumptions. The economic assumptions used by the Commission are summarized in Table 2.(9)

Table 2
The Commission's Economic Assumptions

		Wages and salaries		Interest rates(a)	
	Inflation	Real Growth	Total Growth	Real Return	Total Return
			(Per cent)		
A. Most probable economic scenario					
1978	7.3	-.3	7.0	1.7	9.0
1979	6.0	2.0	8.0	2.3	8.3
1980-84	5.5	1.8	7.3	2.4	7.9
1985-89	5.0	2.0	7.0	2.6	7.6
1990 and later	4.0	2.1	6.1	2.4	6.4
B. High probable economic scenario					
1978	9.3	-.3	9.0	1.2	10.5
1979	8.0	2.0	10.0	1.8	9.8
1980-84	7.5	1.8	9.3	2.4	9.9
1985-89	7.0	2.0	9.0	2.6	9.6
1990 and later	6.0	2.1	8.1	2.4	8.4
C. Low probable economic scenario					
1978	6.3	-.3	6.0	1.8	8.1
1979	5.0	2.0	7.0	2.5	7.5
1980-84	4.5	1.8	6.3	2.5	7.0
1985-89	4.0	2.0	6.0	2.7	6.7
1990 and later	2.0	2.1	4.1	2.4	4.4

a Based on long-term government bond index (10 years and over) increased by .30 of 1 per cent to adjust to Government of Canada bonds with terms of 20 or more years.

Source The Royal Commission on the Status of Pensions in Ontario, Volume V, Resource Study, "Methodology and Assumptions."

If we examine some of the relationships in the Commission's most probable economic assumptions the following points are clear:

a) Inflation
The rate of 6 per cent assumed by the Commission in 1977 for 1979 has proved to be incorrect. 1978 was also higher than the predicted rate. The High probable scenario is closer to

reality. However all scenarios forecast a decline in rates to more traditional levels by 1990; this decline, barring such shocks as that engendered by the OPEC price increases, is likely to reflect reality. The Commission compared the effects of the high probable assumptions against those based on most probable assumptions and was satisfied that the differences were not significant for long-term planning. Comparisons are set out in the next chapter.

b) Real Wage and Salary Growth

1978 rates reflect the presence of the Anti-Inflation Board. 1979 returns to the expectation of the traditional growth rate of 2 per cent. The downswing in the period 1980-84 forecasts a continuing oversupply of labour while the return to 2 per cent in the next period reflects the predicted skilled labour shortage of the late 1980s. It is noted in Statutory Actuarial Report No. 6 that the annual real increase in earnings may have dropped below the traditional long-term 2 per cent to 1.5 per cent, although 2 per cent was used for the main projections. The Commission used a long-term rate of 2.1 per cent but also made projections based on .5 per cent above and below that level; we therefore have projections which can be compared with the Statutory Actuarial Report.

c) Investment Rate of Return

There is also a movement away from historical patterns in our assumption for real rate of return on investments. The Commission does not adopt the 3 per cent traditional rate but has geared the rate of return to actual experience, with projections based on long-term rates for government bonds.

Since the design of the CPP requires the interest rate on loans to the provinces to be set in relation to rates on long-term Government of Canada bonds there is justification for using these rates, normally slightly less than the rates on private issuer securities. The trend line for ten-year bonds shows a 2.25 per cent rate; by extrapolation the Commission has adopted a 2.4 per cent rate for twenty-year bonds of the provinces.

d) Work-force Participation Rates

A striking feature of recent years has been the increasing work-force participation of females. At younger ages the proportion of women in the work-force is quite high, and not much room remains for further improvement. At ages over 40, however, we may expect a yet higher proportion of women to work outside the home. This trend is correlated with changing lifestyles and to some extent with the falling birth rate, although many women resume working as soon as possible after child-bearing and rely on day care facilities and care provided by others in the home. The evidence suggests that partici-

pation rates for females will continue to grow until they are close to those of males. The Commission's assumptions show a higher participation of females in all age groups than do those used for the Statutory Actuarial Report No. 6.

Participation is also affected by unemployment and the tendency for people to spend more years at school. Retirement age policies also affect participation; the work-force is reduced by any move towards early retirement, but will be increased as mandatory retirement rules are removed. The Commission believes participation rates for both men and women in the over-60 group will increase in times of high inflation. If more flexible retirement age policies are adopted even higher participation may result, but our projections are based on present practices.

Other Assumptions

Other assumptions were required before the Commission made its projections. Where possible, the Commission adopted assumptions identical or similar to those used by the Federal Department of Insurance in its projections for Statutory Actuarial Report No. 6. It has been possible therefore to draw useful comparisons, (in Chapter 6) keeping in mind the differences in fertility and economic assumptions.

Areas for Analysis

Having determined its assumptions and made its population projections for Canada, Canada less Quebec (the population base for the CPP), and Ontario, the Commission set about making projections for the period 1978 to 2050 for the following aspects of the CPP:

1. Expenditures - a breakout of amounts paid for
   a) retirement benefits,
   b) welfare benefits (disability, survivor, and orphan benefits),
   c) cost of indexing each of a) and b);

2. Expenditures - in million of dollars and as a percentage of contributory earnings;

3. Contributions on three bases - pay-go, partially funded and fully funded (entry age level cost).

The resulting projections were used for comparisons of the effects on the Statutory Report funding patterns, Funds A, B, and C, defined previously in this chapter. In addition, the Commission tested three other possible designs which it designated Funds D, E, and F. These funds reflect the use of entry age level contribution to determine contribution rates for different combinations of benefit. Entry Age

Level Cost was determined by taking an age cohort age 18 on December 31, 1977 and projecting the cost on the basis that the contribution rate would result in a nil fund for that cohort at the end of all contributions and all expenditures for that cohort.

Fund D (full funding)

All benefits and the cost of indexing for all benefits are funded on entry age level cost.

Fund E

Retirement benefits and their indexing costs are funded on entry age level cost and all welfare benefits and their indexing costs are pay-go.

Fund F

Retirement benefits (unindexed) are funded on entry age level cost, and welfare benefits and the cost of indexing for both retirement and welfare benefits are pay-go.

Also developed from the projections were figures showing the fund size as a multiple of the benefit pay-out in the year. This is useful to assess a suitable fund size. The effect of reinstating the earnings test used in the CPP until 1974 was also tested for Funds A, B, and C.

We decided that special consideration should be given to the effects of the baby boom on the plan. We therefore made further calculations to determine the "extra" births over the assumed normal total fertility rate, and projected the effects of this group on funds A, B, and C.(10)

When we examined the projection runs for Funds A,B, and C, we found that the Ontario figures did not vary significantly from the Canada less Quebec figures. Therefore we eliminated this breakdown for further runs. For those interested we have included in the Appendices several tables showing Ontario figures compared with those for Canada less Quebec. Ontario ranges very close to the 50 per cent mark for expenditures, is slightly lower in terms of unfunded actuarial liability and is slightly above the average level for pay-go contributions until after 2025. It is clear that Ontario pays and receives an appropriate share under the plan and there are no aberrations which appear likely to disturb this position for the future.(11)

We have also included a comparison of dependency ratios between Ontario and Canada less Quebec, based on our most probable fertility assumption.(12) Again, in view of the negligible differences, we did not project Ontario dependency ratios on other fertility assumptions, but proceeded on the basis of the Canada less Quebec projections.

These projections give us the information we need to sort fact from fantasy in the debate on the Canada Pension Plan. The most relevant tables are published in Appendices A to F. The complete projections can be made available to interested persons through the Ontario Archivist.

NOTES

(1) Description of funds from Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977.

(2) Ibid., p. 5.

(3) G.N. Calvert, Pensions and Survival, Toronto 1977, Chapter 5.

(4) Ibid., p. 87.

(5) Canada Pension Plan Statutory Actuarial Report No. 3 as at December 31, 1973, p. 55.

(6) See Volume V, Resource Study, "Methodology and Assumption."

(7) "Methodology and Assumptions." See also: Daniel Kubat, "The Demography of Older Canadians," in Volume IX.

(8) Canada Pension Plan Statutory Actuarial Report No. 6, 1977, pp. 40, ff.

(9) See "Methodology and Assumptions."

(10) Appendix D, Tables D-14, D-15 and D-16.

(11) Appendix C, Tables C-9, C-10 and C-11.

(12) Appendix B, Table B-2 and B-3.

LIST OF TABLES

Table 1 - The Commission's Fertility Assumptions 60
Table 2 - The Commission's Economic Assumptions 61

Chapter 6

Analysis of the Commission's Projections

The first step in the Commission's assessment of the Canada Pension Plan was to forecast the future of the plan on its present funding pattern, based on the Commission's projections. This meant looking at several aspects of future cost: the effect on fund patterns A, B, and C; the effect on contribution rates; the effect of reintroducing the former earnings test; and the effect of varying the assumptions. Finally, the results were compared with the latest Statutory Actuarial Report for the plan.

Future Cost of Existing CPP Benefits

Assuming that the benefit structure remains unchanged and at its present level, the costs of the CPP on a pay-go basis expressed as a percentage of contributory earnings based on the Commission's most probable assumptions are as follows:(1)

1978	2.36 per cent
1980	2.86
1990	4.61
2000	5.73
2010	6.34
2020	8.08
2030	9.28
2040	8.87
2050	9.45

Note that until after 1985, contribution income at the present rate of 3.6 per cent more than covers benefit payments.

The cost rises steadily to about 2-1/2 times the present rate, but does not reach the full funding rate of 9.66 per cent discussed

below.(2) The cost reaches a peak in 2030 and then declines, illustrating the effect of the baby boom of the 1945-1965 period.

Future Cost of Existing CPP Benefits by Category

Because the CPP provides disability pensions for disabled workers and their dependents and survivor pensions for survivors of active workers, as well as retirement pensions and retiree survivor pensions, the Commission sought infonmation on their respective cost. Table 1 shows costs separately for non-indexed portions of retirement pensions, disability benefits (called welfare benefits elsewhere in this Volume)(3) and the costs for indexing the respective benefits,(4) as well as the total pay-go costs for these benefits. All costs are expressed as a percentage of contributory earnings to the plan for the respective years. Thus, in 1980, non-indexed retirement benefits account for 1.44 per cent of contributory earnings, and indexing of retirement benefits .28 per cent, for a total of 1.72 per cent; total cost for all benefits, indexed, plus expenses, is 2.86 per cent of contributory earnings for the year.

From Table 1 we see that "welfare" benefits account for about 40 per cent of the total cost in 1980. As the plan matures, the proportion for welfare drops to 25 per cent. These figures assume a constant proportion of disability in the work-force; an increased propensity to claim disability pensions, or lowering of retirement entitlement age, would change the balance between retirement and welfare components.

The indexing cost rises from 15 per cent of the total in 1980 to about 28 per cent after year 2000 and then to 30 per cent based on the "most probable" assumptions. The division of the cost into the indexed and non-indexed portions is sensitive to changes in assumptions for the rate of inflation. If the inflation assumptions were changed, total cost as a percentage of contributory earnings would not be greatly affected, but the allocation between indexed and non-indexed would be. It is important to realize that there is a significant cost for the full indexing under the plan, and that the cost of providing it does represent 30 per cent of the cost by 2010 - or double today's cost related to contributory earnings.

Future Cost for Ontario

The costs of CPP benefits for Ontario alone were calculated using the same fertility and economic assumptions but an Ontario population base. Costs for Ontario expressed as a percentage of contributory earnings were higher than for the overall plan until about year 2025, and then were lower. The maximum difference was about 6 per cent in the year 2000.(5) The higher cost for Ontario can be attributed to differences in the present age distribution and work-force participation in Ontario. The differences are significant, but not so large as to

Table 1
Canada Pension Plan Expenditures as a Percentage of Contributory Earnings, Canada Less Quebec, 1978-2050

	Retirement		Disability		Survivors			Total		
	Non-indexed portion	Indexed portion	Non-indexed portion	Indexed portion	Non-indexed portion	Indexed portion	Expenses	Non-indexed portion(a)	Indexed portion	Grand total
					(Per cent)					
1978	1.21	.17	.29	.02	.52	.05	.10	2.12	.24	2.36
1980	1.44	.28	.29	.05	.59	.11	.10	2.42	.44	2.86
1983	1.56	.42	.29	.08	.64	.19	.10	2.59	.69	3.28
1985	1.69	.51	.30	.09	.64	.24	.10	2.73	.83	3.56
1987	1.92	.61	.31	.10	.66	.29	.10	2.99	1.00	3.99
1990	2.27	.74	.32	.12	.70	.37	.10	3.39	1.23	4.61
2000	2.85	.99	.34	.13	.80	.51	.10	4.10	1.63	5.73
2010	3.21	1.11	.38	.15	.81	.58	.10	4.50	1.84	6.34
2020	4.43	1.47	.39	.15	.89	.66	.10	5.81	2.28	8.08
2030	5.16	1.89	.34	.13	.94	.72	.10	6.54	2.75	9.28
2040	4.63	1.99	.37	.12	.92	.74	.10	6.03	2.85	8.87
2050	5.19	2.01	.38	.12	.92	.73	.10	6.59	2.87	9.45

a Includes expenses.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions. See Appendix C-4.

suggest that the Ontario government should on this account pursue different policies from other provinces.

Effect on Cost of Varying Assumptions

The effect on costs of varying the fertility and economic assumptions is shown in Table 2.

Fertility

The effect of varying the fertility assumptions is negligible until after the year 2000 when people born after 1978 begin to enter the work-force. Predictably, a low birth rate would require a higher contribution rate and a high birth rate would reduce it. The effect of changing the fertility rate assumption would be at its maximum in year 2030, would diminish to 2040, and would rise again by 2050.

As we have noted, fertility assumptions are subject to a large margin of error; hence, projections become progressively speculative as we look further into the future. However, projections are useful in indicating the range of effects that varying fertility could have on CPP costs. Thus, by the year 2020, assuming the Commission's most probable economic assumption, the costs compared with the Commission's most probable fertility assumption would be increased by 10 per cent if we used the very low fertility assumption, increased by 5 per cent if we used the low fertility assumption, and decreased by 7-1/2 per cent if we used the high fertility assumption.

Economic

The effect of changing the economic assumption is also shown in Table 2. Briefly, the low and high economic assumptions are that inflation will be 1 per cent lower and 2 per cent higher than the most probable inflation rate. The most probable long-term rate is assumed to be 4 per cent per annum. The growth rate of average wages and salaries is taken as 2.1 per cent above the rate of inflation in all scenarios.

It will be seen that the inflation rate has only a minor effect on total benefit payments on a pay-go basis, expressed as a percentage of contributory earnings. There is however some "inflation dividend" after 1990. Costs are lower with high inflation; but the differences are not more than 1-1/2 per cent at any time.

However, inflation has an important effect if the total cost is split between the cost of indexing and the cost of benefits before post-retirement indexing. Table 3 shows that the indexing cost after the year 2000 levels out at about 30 per cent of total costs (on the most probable economic assumptions). However, it would be 39 per cent if inflation were 2 per cent higher and about 24 per cent if inflation were 1 per cent lower.

Table 2
Canada Pension Plan Comparison of Expenditures as Percentages of Contributory Earnings for Various Economic/ Fertility Assumptions

Assumptions							
Economic:	Most probable				Low	High	High
Fertility:	Most probable	Low/Low	Low	High	Most probable	Most probable	Low/low
	(Per cent)						
1978	2.36	2.36	2.36	2.36	2.34	2.37	2.37
1980	2.86	2.86	2.86	2.86	2.85	2.89	2.89
1990	4.61	4.60	4.60	4.62	4.68	4.34	4.32
2000	5.73	5.82	5.79	5.65	5.78	5.59	5.68
2010	6.34	6.79	6.62	5.99	6.38	6.26	6.71
2020	8.08	8.87	8.45	7.48	8.11	8.02	8.81
2030	9.28	10.63	9.82	8.49	9.32	9.21	10.56
2040	8.87	10.50	9.42	8.06	8.92	8.79	10.40
2050	9.45	10.60	9.50	9.13	9.52	9.34	10.48

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario. See Appendix C-7 and Appendix G-1.

Table 3
Canada Pension Plan Expenditures as Percentages of Contributory Earnings, Canada less Quebec, 1978-2050

	Most probable			High inflation			Low inflation		
	Total Cost	Indexed Portion	Ratio	Total Cost	Indexed portion	Ratio	Total cost	Indexed portion	Ratio
					(Per cent)				
1978	2.36	.24	10	2.37	.27	11	2.34	.23	10
1980	2.86	.44	15	2.89	.52	18	2.85	.40	14
1990	4.61	1.23	27	4.34	1.45	33	4.68	1.06	23
2000	2.73	1.63	28	5.59	2.03	36	5.78	1.36	24
2010	6.34	1.84	29	6.26	2.35	38	6.38	1.51	24
2020	8.08	2.28	28	8.02	2.94	37	8.11	1.85	23
2030	9.28	2.74	30	9.21	3.56	39	9.32	2.23	24
2040	8.87	2.85	32	8.79	3.68	42	8.92	2.33	26
2050	9.45	2.86	30	9.34	3.70	40	9.52	2.33	24

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility assumptions.

The reason may be explained readily. Benefits under the Canada Pension Plan are indexed and therefore rise with inflation. Wages and salaries rise with inflation, and the limits on contributory earnings under the CPP are also indexed. Hence inflation has little effect on the ratio of benefits to contributions in a particular year. If, however, inflation increases, the original dollar amount of pension buys less, and the indexing adjustment needed to maintain the real value of the pension must be higher. Contributions increase, since the indexing adjustment to contribution income is built in. As a result, while inflation has little effect on contribution percentage rates, it causes the portion of the contribution rate for the original pension to fall and for the indexing element to rise. Appendix G-1 shows the result of what might be considered the worst scenario for the CPP for the future, within the Commission's range of assumptions, i.e., the combination of high economic assumptions (inflation rates continuing at 6 per cent) and low/low fertility rates (.9 fertility rate producing a declining population). Comparing the figures in Table 2 and Appendix G-1, we can see the "inflation dividend": from higher rates of inflation results in contribution rates after 1980 which are actually lower than for low/low fertility and most probable economic assumptions.

Effect of Funding Patterns on Cost Projections

Cost projections for the CPP will produce different results depending on the funding design selected. The foregoing discussion dealt with cost on a completely pay-go basis. Once a design of partial or full funding is selected, different cost patterns will emerge.

For fund A the contribution rate remains fixed at 3.6 per cent throughout the three phases described earlier. The ends of these phases have become known as the "critical years." The Commission's projections on its most probable assumptions show the crucial years to be the following:(6)

1. The first critical year is 1986. This is the first year the cash flow to the provinces from contributions is zero. In other words it is the first year that payments for benefits and expenses exceed the income produced by the 3.6 per cent contributions. The provinces are required to pay interest on their borrowings from the CPP fund, but this money is also available for new loans unless required for benefits. For several years after the first critical year, the fund continues to grow because interest exceeds the net outflow of benefits (payments less contributions).

2. The second critical year is 1991. This is the first year the provinces cannot borrow any part of their interest payments. In other words it is the first year that payments for benefits and expenses exceed the contribution income plus the interest on the CPP fund. The fund has reached its peak and has started

to decline. From this point on, the provinces have to make capital repayments as well as paying interest on the outstanding balances.

3. The third critical year is 2001. This is the year that the fund is exhausted. In other words, it is the first year that payments for benefits and expenses exceed the contribution income plus the interest plus the remaining balance in the fund. At this point the provinces have completely repaid their borrowings from the CPP fund. Unless contributions are increased, the plan must borrow from the federal government in order to pay the benefits and expenses.

Having established the critical dates, let us examine the costs involved in the alternative funding pattern set out in the Statutory Actuarial Reports. Fund A assumes no change in the 3.6 per cent contribution rate until the fund is exhausted in the third critical year. Fund B assumes that contributions will be raised at least to the pay-go rate in the first critical year, so that the provinces do not repay capital; interest is paid and borrowed back, and the fund continues to grow by the interest because interest is not used to pay benefits. Fund C assumes that contributions will be raised in the second critical year, so that the provinces do not have to repay capital but do make annual interest payments which are used to pay benefits. The fund is then fixed in size at the end of the second critical year.

The contributions required and the size of the fund under these three methods are shown in the following table. The funds in dollars are very large; for convenience, the funds are shown as multiples of the benefit outgo in the year. Under Fund B the fund continues to grow but not at as fast a rate as benefits. Under Fund C the fund remains constant but declines in relation to benefits.

Table 4
Comparison of Contribution Rates as a Percentage of Contributory Earnings and of the Fund Size as a Multiple of Benefits

	Contribution rates			Size of fund		
	Fund A	Fund B	Fund C	Fund A	Fund B	Fund C
	(Per cent)			(Per cent)		
1980	3.6	3.6	3.6	8.5	8.5	8.5
1990	3.6	4.61	3.6	4.0	4.7	4.0
2000	3.6	5.73	5.07	.3	3.8	1.6
2010	6.34	6.34	6.05	-	3.1	.7
2020	8.08	8.08	7.92	-	2.4	.3
2030	9.28	9.28	9.19	-	2.1	.1
2040	8.87	8.87	8.83	-	2.1	.1
2050	9.45	9.45	9.43	-	2.0	-

Source The Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix D-1.

Full Funding Projections with Pay-go Elements

The Commission constructed its own designs for full funding projections. These designs are referred to as Funds D, E, and F. These funds are basically those required for a fully funded Canada Pension Plan. The funding methods do not depend on critical dates, but spread some or all of the cost on a level contribution basis. We have chosen 1980 as the starting year for the increased contribution rates. Costs are computed for retirement benefits, welfare benefits, and the indexing of these benefits.

Under Funds D, E, and F, the plan or part of the plan is funded on an entry age level cost actuarial funding method, the basis often chosen for employment pension plans. Fund D applies this funding method to all benefits; Fund E applies it to retirement benefits only; and Fund F applies the method only to the non-indexed part of retirement benefits. Other benefits in Fund E and Fund F are provided on a pay-as-you-go basis. In each of these funds a liability exists at the beginning because the present population is over the assumed entry age; i.e., part of the membership has been in the plan before 1980 and has not paid the level cost for the first 13 years of the plan's operation and the years before that. The level cost for these years would have been more than the 3.6 per cent actually paid. For our calculations, this liability is spread over 50 years (only 15 years would be allowed for paying off such a liability in an employment pension plan).

On the Commission's most probable assumptions the contribution rates and the fund accumulations are as follows. The fund is expressed as a multiple of the benefits paid in the year.

Table 5
Comparison of Contribution Rates as a Percentage of Contributory Earnings

		Contribution rates		
	Pay-go	D	E	F
		(Per cent)		
1980	2.86	12.53	9.48	6.98
1990	4.61	12.53	10.82	8.78
2000	5.73	12.53	11.11	9.31
2010	6.34	12.53	11.24	9.59
2020	8.08	12.53	11.40	10.08
2030	9.28	9.66	9.38	9.18
2040	8.87	9.66	9.41	9.30
2050	9.45	9.66	9.40	9.32

Source Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix D-4.

In its analysis the Commission isolated costs for welfare benefits and for indexing both retirement and welfare benefits. The object was to explore areas of possible compromise whereby retirement benefits might be fully funded and other elements would be on a pay-go basis. The pay-go arrangements for the other elements would then follow the OAS which is paid on a current basis out of government revenues. The difference would be that OAS is paid for by all taxpayers while the CPP pay-go elements would be paid for by all contributors to the CPP. It was also a question of what proportion of the CPP would be taken up by disability benefits in the future. The projections show that expenditures for welfare benefits (assuming the same degree of utilization as at present) will actually decline from their present 40 per cent to 25 per cent of retirement benefit costs. Concerns that the welfare element will outweigh the retirement aspects of the CPP appear to be unfounded. Looking at Table 5 and the contribution rates required for each of Funds D, E, and F we see that contribution rates for full funding (Fund D) are not greatly in excess of those for Funds E and F with various combinations of full and pay-go arrangements, except during the first ten or fifteen years of the fifty years during which the unfunded actuarial liability is being paid off. Once we reach 2030 and the unfunded liability is paid the rates for each of the Funds D, E, and F are very similar. They are also close to the pay-go rate. Turning to fund size, we see from Table 6 that the funds generated by patterns from Funds D, E, and F would be enormous, both in total dollars and as a multiple of current benefits.

Table 6
Comparison of Fund Size in Billions of Dollars and as a Multiple of Current Benefits

	Billions of dollars (rounded)			Multiple of benefits		
	Fund D	Fund E	Fund F	Fund D	Fund E	Fund F
1980	25	23	21	11.7	10.6	9.7
1990	219	170	124	24.6	19.1	13.9
2000	712	556	392	31.8	24.9	17.5
2010	1,854	1,455	1,010	36.6	28.7	19.9
2020	4,247	3,323	2,266	35.1	27.5	18.7
2030	8,860	6,855	4,607	33.9	26.3	17.6
2040	16,788	12,915	8,670	35.1	27.0	18.1
2050	31,828	24,379	16,370	33.7	25.8	17.3

Source Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix D-4.

The implications of these fund projections for both the Canada Pension Plan and the finances of the Government of Ontario are discussed in the next chapter, which deals with the funding debate.

Effect on Cost of Reintroduction of the Earnings Test

When the CPP was instituted, a person between age 65 and 70 was not entitled to receive his full retirement pension from the CPP while he had earnings from employment. The test encompassed $1 offset in retirement benefits for each $2 of earned income from 18 to 30 per cent of the YMPE, and $1 for each $1 of earned income in excess of 30 per cent of the YMPE. This followed the practice in the U.S. Social Security program, whose primary objective "was to help prevent economic insecurity due to loss of earnings in retirement by providing cash income for those who had substantially withdrawn from the labour force."(7) The U.S. system continues to impose an earnings test until age 72. In Canada, however, the earnings test was removed from the CPP in 1974 and from the Quebec Pension Plan in 1975.

The Commission decided to ascertain the cost effect of reintroducing the earnings test in its original form. The effects, based on the Commission's most probable assumptions, are shown in detail in Appendix D-9 to D-13. The following conclusions can be drawn from the projections:

- With the earnings test, pay-go contributions are reduced by approximately 4 per cent (see Appendix D-9). For example, pay-go costs in 1980 are 2.73 per cent with the earnings test and 2.86 per cent without; in 2020, 7.76 per cent as opposed to 8.08 per cent, and in 2050, 9.08 per cent as opposed to 9.45 per cent.

- The full funding contribution rate is about 2.2 per cent lower with the earnings test (9.35 per cent as opposed to 9.56 per cent) while the 50-year amortization payment of the initial entry age unfunded actuarial liability is about 6 per cent lower (2.7 per cent as opposed to 2.87 per cent). The combination of the two cost factors for full funding is .38 per cent lower (12.05 per cent as opposed to 12.43 per cent) (see Appendix D-13).

- Under Fund A the maximum fund occurs in 1993 instead of 1992, and the fund is exhausted in 2003 rather than 2001 (see Appendix D-10). (The significance of these dates will be discussed later in this chapter.)

Reintroduction of the earnings test would therefore result in possible cost savings. To make this change means moving from all absolute entitlement at age 65 to the U.S. practice of income replacement after substantial retirement from the labour force. This would require a major policy change.

Comparison of the Commission's Projections with Statutory Actuarial Report No. 6

The Commission decided to undertake its own projections of the CPP because of the criticism directed at some of the assumptions in Statutory Actuarial Report No. 3 as of December 31, 1973. However, during the course of the Commission's work, Statutory Actuarial Report No. 6 as of December 31, 1977 was released. This report updated the federal Department of Insurance projections for the CPP. A comparison of Report No. 6 and the Commission's projections is useful to assess the significance of differences in assumptions. Appendix E is a complete summary and comparison of the report and the Commission's work. The more important differences are:

1. Ultimate rates of growth in real wages (earnings less inflation) were established at 2.1 per cent by the Commission and 2 per cent by the Department of Insurance. This is a significant change for the Department, since it used a 2.5 per cent real rate in the 1973 valuation. The change resulted from leaving the assumption for average growth in earnings at 5.5 per cent and moving the inflation rate from its previous level of 3 per cent to 3.5 per cent.

2. The Department's rate of investment return was kept at its former level of 6.5 per cent. With a 3.5 per cent inflation rate this assumes a real rate of return of 3.0 per cent. This compares to the Commission's ultimate real rate of 2.4 per cent.

3. Although the ultimate fertility rates reached by both groups were virtually the same, the key difference is the Commission's use of the "baby boom echo" as recommended by Kubat for the period ending in 1995, providing a higher fertility rate to the year 2000.

4. A major area of difference occurs in the immigration assumptions. The Commission started with a net annual figure (immigrants less emigrants) of 60,000 and increased this by 1/2 of 1 per cent per year to an ultimate fixed level in the years 2000 and later. The Department of Insurance on the other hand, took net immigration at a constant .465 per cent of each year's total population. The additional population resulting from this higher net immigration assumption has a significant impact on pay-go contribution rates. For example, the 8.73 per cent pay-go rate for the year 2050 on the Department's assumptions becomes 9.45 per cent if net immigration is frozen at 100,000 per year as the Commission has done. The Commission's assumption for net immigration may be somewhat on the low side, but the divergence becomes most noticeable in the distant years of our projections.

5. The Department and the Commission used identical mortality rates. Extension of the improvement in mortality from the year 2000 to the year 2050 has resulted in an increase in pay-go contribution rates of about .5 of 1 per cent by the year 2050. If life expectancy does not improve to the extent projected, pay-go costs will be somewhat lower.

Even with these differences we find that the Department's projections and those of the Commission do not diverge greatly in any aspect.

Statutory Actuarial Report No. 3 as at December 31, 1973 estimated that with the amendments to the plan (which were subsequently adopted) the first critical date, i.e., when contributions equal payout, would be as early as 1982. Report No. 6 at December 31, 1977 has put this date back to 1985 based on the new projections. The Commission's projections set the date at 1986. The following chart compares the estimates of the critical dates:

Table 7
Canada Pension Plan - Critical Years

CPP actuarial report	1966	1969	1972 No.3	1973 No.4	1973	1977 No.6	1978 Royal Comm.
Year benefits first exceed contributions	1981	1985	1985	1985	1982	1985	1986
Year benefits first equal contributions plus interest	1986	1995	1996	1995	1988	1990	1991
Year fund is first exhausted	2001		2014	2008	1999	2003	2001

NOTE - The CPP has been improved on several occasions.
- The "1973 proposed" plan is basically the plan now in force.
- The above dates are estimated from the CPP Actuarial Reports, some of which give figures at five-year intervals only.
- Where the report gives several projections, the intermediate has been used. The 1966 figures assume 4 per cent inflation. The 1969 and 1972 figures assume "reasonable stability." The 1977 figures assume a narrowing between the rate of increase in earnings and increase in prices.
- The Royal Commission projections are based on its most probable assumptions.

Source The Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix E.

Pay-go contributions using Fund B design are very close for the two sets of projections until 2000. Thereafter they diverge significantly, so that by 2050 the Commission's rate of 9.45 per cent is nearly 8 per cent higher than the Department's 8.76 per cent.(8) Lower immigration, higher inflation, and slightly higher growth in real wages in the Commission's assumptions have led to this result.

Some further contrasts in the population and financial results of the projections are shown in Appendix E-3, including:

1. The population projected by the Commission for the year 2050 is about 87.5 per cent of the one projected by the Department of Insurance. This reflects primarily differences in immigration.

2. Absolute dollar expenditures projected by the Commission are 49 per cent higher than for the Department of Insurance projections but contributory earnings are also considerably higher for the Commission's projections due to the higher assumptions for growth in earnings and therefore higher amounts from contributions.

3. The fully funded rate for the Commission is higher than the Department's (9.56 per cent against 8.04 per cent) in part because of the lower real rate of return on investments. A change in the real rate of return by the Department of Insurance from 3.0 per cent to 2.5 per cent leads to a 9.38 per cent entry age cost which is very close to the 9.56 per cent rate developed by the Commission.

4. The initial unfunded entry age actuarial liabilities developed by the Department of Insurance are lower than for the Commission projection which is $98.5 billion. The Department's projections are $81.3 billion for the Department's most probable scenario which uses a 3.0 per cent real rate of return, and $84.4 billion with a 2.5 per cent real rate of return. The unfunded liability difference also arises from the Commission's higher assumption for growth in earnings.

Comparison of results of the two sets of projections for Fund C on a number of alternative assumptions will be found in Appendix E, Tables E-4 and E-5.

Statutory actuarial reports on the CPP are designed to give policy makers ample notice of decisions to be made. The Commission's projections and those of the Statutory Actuarial Report No. 6 are so close that the Commission is satisfied that the critical dates shown by the Department of Insurance can be relied on for the purpose of making policy decisions. Postponement of the earliest time when contribution rates would have to be raised from 1982 to 1985 or 1986 gives more time for decision making; but it should not be used for procrastination. A

decision should also be made now on the ultimate disposition of the fund. If for instance, the fund is to be allowed to run out after the turn of the century, the provinces should be given notice now, since the repayment of the borrowed capital may be a particularly heavy burden on some provinces. Consideration of policy alternatives is set out in the Commission's recommendations.

NOTES

(1) See Appendix C-4.

(2) The fully funded contribution rate is 9.56 (expenses of .1 per cent omitted) + 2.87 to amortize the existing unfunded liability over 50 years, for a total required contribution rate now of 12.53 per cent. The pay-go contribution rate never meets the fully funded rate if the GNP in real terms (that is with inflation discounted) is rising, due to growing population or growing productivity per capita. The workers who support the pension load today, say at 10 per cent of today's GNP, will, when they retire, receive more than that, namely 10 per cent of GNP in a future year. This fact is sometimes referred to as the "social insurance paradox."

(3) "Welfare benefits" includes disability pensions and surviving spouses' and orphans' pensions arising from the death of an active worker. Survivor pensions arising from retirement benefits have been included in retirement benefits. See Volume V, Resource Study, "Methodology and Assumptions."

(4) Indexing cost is for post-retirement adjustment of benefits according to movements in the Consumer Price Index. Pre-retirement adjustments of contributory earnings, based on the Average Industrial Wage, are included in projections of initial retirement benefits.

(5) See Appendix C-9.

(6) See Appendix D-3 for detailed projections.

(7) Wm. C. Greenough and Francis P. King, Pension Plans and Public Policy.

(8) See Appendix E-2; and Statutory Actuarial Report No. 6, p. 7.

LIST OF TABLES

Table 1 - Canada Pension Plan Expenditures as a Percentage of Contributory Earnings, Canada Less Quebec, 1978-2050 70
Table 2 - Canada Pension Plan Comparison of Expenditures as Percentages of Contributory Earnings for Various Economic/Fertility Assumptions 72
Table 3 - Canada Pension Plan Expenditures as Percentages of Contributory Earnings, Canada less Quebec, 1978-2050 73
Table 4 - Comparison of Contribution Rates as a Percentage of Contributory Earnings and of the Fund Size as a Multiple of Benefits 75
Table 5 - Comparison of Contribution Rates as a Percentage of Contributory Earnings 76
Table 6 - Comparison of Fund Size in Billions of Dollars and as a Multiple of Current Benefits 77
Table 7 - Canada Pension Plan - Critical Years 80

Chapter 7

Problems in the Funding Design of the Canada Pension Plan

When the CPP was adopted in 1965 specific decisions were made on its funding design. These decisions produced a hybrid design which involved both pay-go elements and fund accumulation. The pay-go contribution rate required at that time was less than 1 per cent, but the decision was made to fix a 3.6 per cent contribution rate. Funds not needed for current benefit payments were then available for provincial borrowing. At the outset it was understood that major decisions would have to be made in 20 or 30 years' time about the course of CPP operations because the fund would be ultimately exhausted and contribution rates would have to rise.

Had the original decision been to finance the CPP on an entirely pay-go basis, today's concerns would be relatively simple, though perhaps controversial to the extent that pensions are viewed as an increasingly heavy burden on the active labour force. The need for higher contribution rates would be evident; but the increments would be gradual and, over a fairly long period, predictable according to the retirement rate of present contributors.

Instead, the controversy has raged around three perceived, though not necessarily real, problems:

1. The potential exhaustion of the fund has conjured up the spectre of bankruptcy, with thousands of disillusioned retirees whose CPP benefits must therefore remain unpaid. The prominence given by the press to this highly fanciful scenario seems to have created widespread cynicism about the plan. No doubt it has also created much unwarranted anxiety among the millions

of Canadians who count on CPP benefits as a large portion of their retirement income.

2. The possibility, based on low birth rates, that the number of workers available to support the retiring baby boom of the postwar era will be so small that there will be revolution rather than submission to onerous contribution rates. This problem is also stated in terms of the inequity of intergenerational subsidies.

3. The theory that a pay-go public pension results in lower personal savings - hence a loss of capital to increase productivity and national wealth. Presumably a fully funded plan would create capital and produce real growth in the economy.

The Commission has directed its attention to each of these problems and the effect on the Canada Pension Plan of several possible solutions.

PROBLEM NUMBER 1 - BANKRUPTCY OF THE CPP

The first problem arises from funding design. A fund has been created which in 1978 stood at about $14.3 billion. Statutory Actuarial Report No. 6 has set out possible funding patterns under the designations Fund A, Fund B, and Fund C. The Commission's projections for these funds are described in the preceding chapter and compared with those in Report No. 6. Other funding options may be conceived, but the three used in the Statutory Actuarial Report illustrate possibilities for future policy decisions. In that context we find the critical years described earlier, i.e. the times forecast for the various events to take place. The Commission projections are within 2 years of the critical years set out in Report No. 6. Depending on which option - Fund A, B, or C - might be selected, the critical year indicates when some decision must be made as to changes in the funding design. Questions for CPP policy-makers include the following:

- whether to raise the contribution rate and by how much;

- whether to cut benefits and by how much;

- whether to change the contribution base to increase contributions;

- whether to change entitlement age to reduce benefits in the short run.

There are many possibilities for change. The mandate of this Commission is to consider the options and recommend a suitable course to the Province of Ontario.

The first problem involves a misunderstanding of the effect of the third critical year under Fund A, when contributions plus interest plus fund assets equal benefit payout (2001-2003). At that time the fund will indeed be exhausted. This does not mean that the CPP is thereby bankrupt. It does mean that some change in financing will have to be made before then to provide the money required to pay the benefits due in the next year.

Sometimes the unfunded actuarial liability of the CPP, calculated as it would be for a private pension plan, is pointed to as an indication of the precarious position of the CPP. The unfunded actuarial liability on an entry age level cost basis for funding as projected by the Department of Insurance at December 31, 1977 is between $81 and $85 billion. This liability, estimated by the Commission at $98 billion, is the amount which would have to be paid into the CPP in 1978 which, with future contributions and interest on the fund would pay for all benefits of those now aged 18 and over. However, to relate this liability to the soundness of the Canada Pension Plan, which is premised on continuance in perpetuity, is meaningless. Like the fear of bankruptcy it indicates an imperfect understanding of the nature of a social insurance program.

A final facet of Problem No. 1 is what has been labelled "Ghost Funding"(1) in the press. Nearly all of the assets in the CPP fund are paper promises of the provinces to pay back the borrowed money with interest.(2) Borrowings are made through non-marketable provincial securities having a term of 20 years, with interest at the average market yield on 20-year Canada bonds applicable at the time of the issue. It is argued that there are no "real" assets to back up the promises of benefits under the CPP, and that by some sleight-of-hand the provinces have drained away the cash and replaced it with paper. The less-than-market rate of interest on the securities has been combined with "Ghost Funding" allegations to attack the credibility of the whole CPP fund design. Although CPP security depends ultimately on the taxing power of the provinces to repay their obligations, it is important that the public have confidence in the plan. The need for CPP funds to be invested in a different fashion is discussed in the Commission's proposals.

PROBLEM NUMBER 2 - SUBSIDIES

There are three types of subsidies in the CPP as it now stands:

1. When the plan was set up, no benefits were paid to those who had made no contributions, and only partial benefits were paid to those who had contributed for less than ten years. However, by 1976 full benefits were payable to those who had contributed for ten years. This short transition period means that those retiring and qualifying for benefits at the present time receive maximum benefits but have contributed for well under

half of their working lives. Therefore, they receive very substantial subsidies. The subsidy is greater than it is for those retired before 1976 who could not receive full benefits, and also greater than for those who will retire in future, who will have contributed longer. Moreover, contributions were established at a low rate which will have to be increased in the future. This favours those retiring in the early years and those with higher incomes. For example, someone who reached age 65 in 1976 had contributed only 1.8 per cent of contributory earnings for only ten years (matched by the employer) and received a pension for life equal to 25 per cent of his or her average pensionable earnings, adjusted for inflation.

The first subsidy can be defended as necessary to ensure that the plan came into full operation in a reasonable time. The fast maturing of the plan has obvious advantages. If benefits were strictly related to contributions paid, then since contributions start at age 18 and retirement age is 65, it would be 47 years before anyone could claim the maximum pension. The pensions produced even today would be quite inadequate.

2. Since the CPP is earnings-related and contribution rates are of equal percentage throughout the range of covered earnings, those with higher earnings benefit more proportionately. For retirements in a particular year, the subsidy is roughly proportional to earnings up to the earnings ceiling, which means that it is higher for people with higher incomes. Some who regard the contribution as a tax therefore criticize the design as "regressive."

   This subsidy should not be considered in isolation, since OAS and GIS are part of the package and were reorganized about the time that the Canada Pension Plan was introduced. Subsidies to the higher paid in the Canada Pension Plan are to a large degree balanced by subsidies to the lower paid under OAS and GIS.

3. Much has been written about intergenerational subsidies in the CPP, particularly those arising from the baby boom. The argument is that on a pay-go basis contribution rates will have to rise sharply when the baby boom population reaches retirement; if the work-force has not expanded proportionately the workers will face a very heavy burden. In this way the baby boom cohorts who paid for a proportionately smaller retired group while they were active will not in fact have paid the price for their retirement during their working lives. Funding to provide cost control, as in a private plan, therefore becomes relevant for a social security plan and is the crux of problem number 3.

Intergenerational subsidies differ in important respects under full funding, partial funding and pay-go arrangements.

Full funding produces the highest contribution rates, but it virtually eliminates intergenerational subsidies. Contributions would have to be very high to remove all subsidies; to remove them for the average future entrant to the system would increase the contribution rate from 3.6 to 12.53 per cent in 1980, reducing to 9.66 per cent by 2050 by which time the unfunded liability would have been paid off.(3) An enormous fund would also be created, the use of which by government raises important policy questions.

Pay-go requires the smallest contributions in the early years, but because of our population structure will require sharply increased contributions about 2020, rising to 9.28 per cent by 2030. This in turn means large intergenerational subsidies. No fund is developed, since by definition revenue from contributions is equal to benefit payments.(4)

Partial funding steers a middle course between full funding and pay-go. A fund is created during the time contribution levels exceed those required for benefit payments; after that, they rise more or less in concert with benefit payments if the population distribution remains stable. Intergenerational subsidies will be reduced during the time the fund continues to be built up. The operation of the present CPP design results in partial funding.

The effectiveness of using a fund for cost control depends on interest accruing to the fund. Under existing provisions, CPP fund assets have been loaned to the provinces at interest rates below market rates. The rate is determined by the rates on long-term Government of Canada bonds, which after 1965 were low by current standards since there were few new issues. Because of this criticism or for financial reasons, the Government of Canada has recently issued new long-term bonds with current market rates. This has had the effect of increasing the rate on CPP monies lent to the provinces. However, the rate on Government of Canada bonds is traditionally below that paid on provincial bonds; therefore the CPP fund will continue to represent an attractive money source for the provinces. The existing investment arrangement falls somewhat short of the best position for maximizing interest return, and so adversely affects the cost control aspect of funding.

The question of the size of the fund created if full or even partial funding were adopted to minimize intergenerational subsidies is discussed with the economic effects of full funding below.

It is also necessary to consider how acceptable the intergenerational subsidy may be to society. From the first, the subsidy was recognized and accepted on the basis of a social contract:

"In return for making a contribution toward the cost of pensions to the current generation of retired wage earners every participant acquires a right to a certain position within the income structure of the society when he eventually retires. That acquired right implies an obligation on the following generation to meet the cost of his benefits."(5)

In order to assess this problem, especially with regard to the baby boom population born between 1945 and 1965 over which there has been so much concern, the Commission undertook a series of projections to develop the financial effects of the extra population arising from the baby boom on the Canada Pension Plan. Full details of these projections appear in Appendix D-14 to D-16.

The technique used was to isolate the "extra population" by assuming a "normal" fertility rate for the period 1945-1965 in line with historical fertility rates for the period 1926-1975 and by deducting the "normal" population projected on this "normal" fertility rate from the actual population. The difference between the two represents the "excess" population of the baby boom. The methodology used is described in detail in Section 6 of the Resource Study: "Methodology and Assumptions." Pay-go rates for the Canada Pension Plan for the "normal" and the "excess" population were then projected. The following table for Fund C, based on the Commission's most probable assumptions, shows some interesting results:

Table 1
Fund C, Canada Pension Plan - Comparison of Critical Years and Pay-go Rates for "Normal Population"(a) and Total Population including Baby Boom Excess

	Canada less Quebec	
	Total population	Excluding baby boom
1. Year cash flow first negative	1986	1984
2. Year cash flow, when negative, equals fund interest (fund remains stable)	1991	1989
3. Pay-go contributions in subsequent years		
	(Per cent)	
2000	5.07	6.21
2010	6.05	6.94
2020	7.92	8.26
2030	9.19	8.90
2040	8.83	8.91
2050	9.43	9.34

a Projection using historical trend fertility rates for the period 1945 to 1965.

Source Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix D-16.

From the table it is clear that until 2030 the presence of the baby boom population results in a lowering of pay-go costs for the CPP, and also an extension of time for the events of the critical years. Only in 2030 do we find the baby boom causing increased cost to the plan, and then only by .29 per cent of contributory earnings. By 2040 the extra population is having less effect on the rates required and by 2050 the effect of the baby boom positively or negatively has virtually disappeared.

The explanation is that the extra population cannot be considered as an isolated group that contributes, draws benefits, and when the last person dies, leaves the plan as it was before. The extra people will have children and grandchildren, so that the contribution income never reverts to what it would have been without the baby boom. To a large extent the extra pensions that will be paid to those born when the birth rate was high will be provided by the contributions of their descendants. While it is true that these projections are based on the Commission's most probable fertility assumption, which is somewhat more optimistic than that of Statistics Canada, the spread within the Commission's low/low fertility assumption and its most probable fertility assumption is not so great that we could expect wide divergences in the pay-go figures. Any large difference is offset by the Commission's use of a more conservative immigration assumption. See also Appendix G-7 which shows virtually the same cost pattern for Fund C using the Commission's low/low fertility and high economic assumptions.

The Commission therefore concludes that the intergenerational transfer in 2030 is neither as large nor as abrupt as some commentators would have had us believe, even if no steps are taken now to smooth out the inevitable increase in contribution rates.

In assessing the possibility of workers refusing to pay for retirees in the future, it is important to realize that the process of increased contributions is likely to be gradual and therefore accepted by each cohort of workers as one of the conditions applying to the work-force at that particular time. Had the present rates of income tax in Canada been projected in 1917 when the Income War Tax Act was passed it is entirely possible that similar predictions would have been made about the future of income taxes and any government which sought to impose them.

Nor must it be forgotten that any increase in the real growth in the economy beyond that projected between now and 2030 will ease the burden for the active workers. To test the validity of this proposition, the Commission made projections for an increase of .5 per cent in the growth of real earnings above the most probable economic assumption, and for a decrease of .5 per cent. For Fund C the effects on the critical dates and required contribution rates were as follows:

Table 2
Effect on Fund C of Variations in Real Growth in Earnings

Real growth in earnings	Most probable	Most probable -.5%	Most probable +.5%
1. Year cash flow first negative	1986	1985	1986
2. Year cash flow negative, equals fund interest, (fund remains stable)	1991	1990	1992
3. Year fund first becomes negative	2001	2000	2002
4. Pay-go contributions in subsequent years (Fund C)		(Per cent)	
2000	5.07	5.32	4.84
2010	6.05	6.35	5.77
2020	7.92	8.31	7.56
2030	9.19	9.68	8.75
2040	8.83	9.36	8.35
2050	9.43	9.98	8.94

Source Royal Commission on the Status of Pensions in Ontario.

Real growth above that projected on the Commission's most probable assumption therefore reduces the cost to the active workers. Real growth below that projected will increase the cost and therefore the burden. Because the economic future is difficult to forecast accurately except as to long-term trends and relationships, we can only assess the effects of a range of possibilities. In the Commission's opinion, the burden for the active work-force in the future is not undue even with the lower real growth in earnings (assuming no increase in benefits as a percentage of earnings).

Finally, the adoption of full funding is only one way in which to exercise cost control in the CPP. In the Commission's opinion the problem of the intergenerational subsidy is not so great as to warrant a change to full funding.

PROBLEM NUMBER 3 - DOES PAY-GO SOCIAL SECURITY DEPRESS SAVINGS?

Those recommending full funding of the Canada Pension Plan stress the possible effects of pay-go financing on the economic health of a country. One theory is that such financing for retirement programs has the undesirable effect of lowering personal savings rates. Chief among the proponents of this theory are Martin Feldstein and Alicia Munnell of

the United States. If savings rates, the argument goes, are lower, new capital for production of wealth (goods and services) is less available and therefore the country is less well off. The argument relies on the hypothesis that with the introduction of socialized protection the individual will save less for his or her own security and instead will increase current consumption. Feldstein estimates that social security wealth reduced the level of personal saving in the United States in 1971 by about 50 per cent, and that this reduction in turn reduced U.S. capital stocks with a resulting reduction in annual GNP.

This argument was adopted by the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs (TEIGA) in a paper presented to the Commission. The paper advanced the position that the public retirement programs in Canada (OAS, GIS, and CPP) between 1952 and 1975 lowered the rate of personal savings by 3.1 per cent, resulting in a 22 per cent reduction in personal savings from disposable income. The result for 1975 was to reduce the level of savings by $3.5 billion and to create a cumulative decline in savings of about $18.9 billion.(6)

It was argued that if the Canada Pension Plan were fully funded instead of on its present basis, pension fund assets would be much higher, with the result that:

> "Translated into economic terms, the extra growth that would result in the Canadian economy had these funds been created and invested in the private sector eventually would finance completely the benefits paid under the Old Age Security, Guaranteed Income Supplement and Canada and Quebec Pension Plans. Thus, instead of supporting the elderly by redistributing income from the work force to the retired, they could be supported from the dividend of real economic growth."(7)

To assess the validity of the theory that public retirement programs depress rates of personal savings is therefore of importance before embarking on a course of full funding. A resource study to this volume is a review of the economic literature on social security funding prepared for the Commission by Arthur Donner and Fred Lazar.(8) Commenting on the theory advanced in the TEIGA paper the authors conclude as follows:

> "From our survey of the empirical and theoretical issues surrounding the appropriate means for financing a public pension system, we conclude that the assertion that the modified pay-as-you-go financing technique is inappropriate does not hold up under close analysis. The evidence on the impact of pay-as-you-go public pension financing on personal saving is so ambiguous that it should be ignored. In any event, personal savings account for a fairly small proportion of national savings in Canada even though the personal savings rate is presently at an all-time high, and thus the pension versus savings question is far from crucial. The

related concern that the presently underfunded CPP/QPP has caused below optimum levels of capital formation in Canada should also be ignored as a real issue. The evidence supporting this proposition begins with the unfounded assertion that national savings are suboptimal and requires the acceptance of a variety of completely unrealistic assumptions about the Canadian economy. Indeed, we commented at some length on the lack of reliability and applicability of the assumptions linking theoretical long-term growth models to the Canadian economy.

"As to the point that a fully funded CPP would generate a higher real rate of return to pension contributors, we note that this depends upon what, in our view, is an inappropriate series of rate-of-return comparisons. Critics of pay-as-you-go funding point out that the correct rate of return to be used in comparison between pay-as-you-go and funded systems is not the real rate of interest that has been earned in the past, but the social rate of return on capital. We argue that there is no reason to make such a sharp distinction between the social rate and the private real rate of return to capital measures in this context, since there is a supposition here that corporations, and not the individuals in the economic system, bear the burden of corporate taxes.

"Further, in order to earn a return approximating the 10 per cent estimated real social rate estimated by Jenkins for Canada, the amount accumulated in a fully funded system would have to be invested solely in equities. As the data in Table 5 indicate, the real rate of return on equity investment has been rather dismal during the past five years, but on a fifty-year basis has been in the 5 to 6 per cent range, a level slightly in excess of the natural growth rate of the economy. If the fifty-year rate of return to equities were earned in the future, then investment of funds in equities under a fully funded system would be preferable to a pay-as-you-go system yielding a rate of return somewhere in the 3 to 4 per cent range; and, if that were the case, then the implicit real rate of return to a pay-as-you-go scheme appears about as attractive as substantial long-term public investment in equities. Under pay-as-you-go, there would not be the additional concern that a large public pension fund would swallow up most of the stock of equity capital in Canada.

"Finally, there remains the problem of the extra large dose of economic deflation Canada would experience if full-investment funding were adopted when the economy already has a high volume of underutilized labour and capital. Indeed, though the plan might increase the volume of national savings by building up a large investment pool of funds, the effect could be quite the reverse, as the paradox of thrift would likely come into play."

In addition to these difficulties with the economic arguments for full funding, the Commission has some other concerns about espousing full funding for the CPP.

Use of a Social Security Fund as an Economic Tool for Raising and Lowering the Acceptable Rate of Personal Saving in the Economy

The CPP is designed to provide a source of income in retirement. Its goals should be to provide this income in the cheapest, most efficient, reliable manner possible. If a new goal is added - i.e., the manipulation of the economy through the fund on the basis that more wealth can be created - we encounter a conflict of objectives. If full funding were adopted before the first critical date of 1985 or 1986, contribution rates would have to be increased almost immediately from 3.6 per cent to somewhere between 8.78 per cent to 12.53 per cent depending on the method chosen for funding welfare benefits and indexing.(9) A sudden increase of this magnitude, or even a gradual increase to this level over a number of years, could create dislocations through increased employer costs and a disincentive for individuals to save in other ways. Even if the fund were used to increase the real growth in GNP in time, the short-run dislocation cannot be ignored. If contribution rates were increased only over a long period, the time lag would probably offset much of the benefit from the lessening of intergenerational subsidies.

How Large a Fund Would be Created by Full Funding?

The CPP fund in 1978 stood at about $14.3 billion. The Commission's projections for Fund C show that in the year 1991 the fund would have peaked and would remain constant at $36.1 billion, at a level four times the total benefit payout for that year.(10) For the same year with full funding (Fund D) the Commission projects the fund to be $251.2 billion with a multiple of 24.6 times the then current payout.(11) By 2030 with full funding, the fund would be just under $9 trillion(12) with a multiple of 33.9 times the then current payout of $261 billion.

Can Such a Large Fund be Utilized in the Canadian Capital Market?

Donner and Lazar point out that to maximize the return required for the economic benefits of full funding it would be necessary to invest in equities. At the present time, available investment opportunities in equities in Canada are shrinking. Total financial assets in Canada at the end of 1977 were about $899 billion. Total financial assets of financial intermediaries in Canada at the end of 1977 were an estimated $450 billion.(13) Already the $40 billion representing funds invested through private pension plans and RRSPs exceeds the market value of the outstanding publicly traded portion of the 300 stocks of the composite index of Toronto Stock Exchange, and is more than half the assets of the top fifty industrial corporations in Canada, excluding the oil companies.

Even the fondest hopes for an economic boom in Canada in the last quarter of this century cannot envisage capital requirements in equity and debt securities together which could accommodate growth in capital in the CPP fund from $14.3 billion to $700 billion by the year 2000 and still allow for any private investors in Canada.

In the Donner-Lazar paper, the highest forecast in growth of assets of financial intermediaries is only $1,858.5 billion(14) by 1990; on a Fund C basis the CPP Fund would account for only 2.6 per cent of the total. If full funding were adopted, it is difficult to see what type of changes would allow utilization of such huge amounts of capital, with the fund growing by $10 billion a year in 1980 and 1981, $62 billion a year in 1990 and 1991, and $147 billion a year in 2000 and 2001.(15)

How Can Effective Control be Exercised over the Fund Which Full Funding Would Create?

From the time the CPP was instituted to the end of 1978, the provinces (other than Quebec) have had available to them for investment total assets of $14.3 billion representing total contributions made to the fund, less payouts, plus interest earned on the assets in the fund. Each year the provinces may draw monies not needed for benefits and each year the provinces have availed themselves of the right. Each year the interest is utilized in similar fashion, as each province simply borrows the interest it is liable to pay; and so avoids any cash payment. As has been noted, interest rates set under the plan are lower than the market rate for provincial bonds; a provincial treasurer could be criticized if he borrowed in the market when cheaper money was available. Ontario had borrowed about 50 per cent of the total fund or $8.4 billion by September, 1979. Coupled with the availability of money has been the great growth in government spending since 1965. In 1976, Darcy McKeough, then Treasurer of Ontario, addressing his fellow finance ministers on financing options for the Canada Pension Plan,(16) spoke of the first critical date for the CPP as the date when "under the existing financial structure of the CPP net provincial cash flow will turn around." He saw the date as the time when contributions would have to be increased, and considered the effects on net provincial borrowing:

> "The question of provincial borrowing has two integral facets. First, the extent to which the restructured CPP continues to be a source of funds for provincial treasuries must be decided. Second, how provincial cash flow should relate to the financing options must also be decided. With regards for the future role of provincial borrowing, my own feeling, for reasons that are explained below, is that the CPP fund should no longer continue as an exclusive source of provincial funding. The economic legitimacy of continuing this role is certainly open to question."

and later,

> "Only one fact remains immutable: net provincial borrowing runs out eventually. It is coming to grips with this fact that will finally determine the financial structure of the Canada Pension Plan."(17)

Although there is no conclusive evidence before the Commission that increased provincial government spending and the availability of funds from the CPP are linked, the fact remains that the provinces will be affected by what happens to the CPP in the next 5 or 6 years. If the structure of the CPP is changed to a full funding basis with no change in investment policy, large amounts will become available to provincial governments. Those who attack full funding declare that this temptation is more than the politician faced with short-run demands can resist. Ability to expand government programs without recourse to the tax base is a politician's dream. Can the politician be expected to exercise current restraint for long-run goals?

Assessing the future on the basis of the past, the Commission considers that continuation of the present borrowing structure with the monies in a fully funded CPP would not be in the best interests of the people of Ontario. It considers that only when monies are borrowed in the money market, at market rates, with payment guaranteed by the tax base and with scheduled repayments, can there be any meaningful restraint on government borrowing. It is significant that no one suggested to the Commission that the provinces be obliged to pay back the capital sums already borrowed from the CPP fund. In fact it may be that some provinces would be hard pressed to do so. Borrowing without concern for repayment is not conducive to wise financial management.

Proponents of full funding who admit this difficulty advocate the investment of the CPP fund in the private sector. Three existing arrangements are pointed to as successful applications of the principle. The Caisse de dépôt et placement du Québec is a Crown corporation set up in 1965 mainly for the purpose of investing the contributions received from the Quebec Pension Plan. The Caisse has achieved a reputation for independence from government control in its operations. Two features distinguish the management of the QPP funds from that of the CPP funds:

> "First, the investment group in the Caisse actively and aggressively manages the funds deposited with it, while the CPP funds are channelled by a formula to the provinces. Second, the majority of the securities acquired by the Caisse are publicly offered and have market-determined yields, while the yields on CPP securities are only indirectly linked to the market. The difference between investing in securities whose prices are market-determined as opposed to private placements at arbitrarily determined prices, is significant..."(18)

Critics of the Quebec arrangement have pointed to the opportunity for the government to advance its economic policies through control of the policy of the Caisse. The priorities of the Caisse management are stated to be: first the protection of the depositors; second, preference for investments of greater potential benefit for the Province of Quebec when the expected return and potential risk between two investments are equal; and third, the creation of a market in Quebec for debt issues at fair market prices.(19)

Private placements by the Caisse have afforded long-term capital to Quebec companies and have had a positive effect on the provincial economy, in the opinion of Quebec actuary, Yves Guérard. Caisse operations have resulted in higher yields to the QPP than the CPP has obtained, although the spread has narrowed with the recent increase in rates on Canada long-term bonds. In 1976 the average yield to the QPP was 8.62 per cent; for the CPP in 1975-76 the yield was 7.54 per cent. Guérard also observes that: "a channelling of additional funds in the private sector and the preservation of market discipline on government borrowing concur in making sure the reserves are used for capital purposes."(20)

Still to be considered, however, is whether the separation between the Caisse and the Quebec government will continue. Independence can only be maintained by the forebearance of the government itself.

A second experiment in investment in the capital market rather than in government bonds is that of Ontario Municipal Employees Retirement System (OMERS). A report on OMERS investment policy in 1973 posed the following as the dominant question to be answered:

> "Should the investment of the funds of OMERS be influenced, to a significant degree, by the borrowing needs of the Province of Ontario or of its local governments; or should the funds of OMERS be invested in the best interests of the employers and the members of OMERS?"(21)

Before 1975, OMERS funds were invested in special non-marketable Ontario government debentures. At that time the investment structure was amended so that a portion of all new money would be invested in the public markets under the normal rules for employment pension plan investments. Now investments are handled by the OMERS staff with an advisory board drawn from the financial community. A satisfactory rate of return is being earned on assets invested in this manner.

The change in OMERS investment policy came as a response to criticism of the government. However, the government remains free to make further amendments placing limitations on market investment in order to satisfy its own borrowing needs.

A third instance in which public pension funds are invested through the private capital market is in Sweden, where the National Pension

Insurance Fund (AP) is invested through four sub-funds to avoid possible government misuse of investment funds. A TEIGA paper, "Financing the Swedish National Pension Plans"(22) provides interesting information about the operating experience of a fully funded segment of a national pension plan. It should be noted, however, that the total amount in the fund of this segment as of April 30, 1977 was only $25 billion, a small amount compared to the projected amounts for a fully funded CPP in 2000. The investment policy is summarized in the paper:

> "The moneys are invested under the auspices of an independent agency. As of April 30th, 1977, the fund had 42 per cent of its assets in housing, 34 per cent in private sector bonds and promissory notes, 16 per cent in central government bonds and 8 per cent in local government bonds. The investment philosophy of the AP is to 'invest in good and valid security, at good interest and readily accessible for redemption.'
>
> "These directives consequently place equity investment at a disadvantage with the result that only 0.6 per cent of the funds assets are invested in shares. Another reason for the Swedes' aversion to equity investment is the strong feeling against the government controlling the economy through its control of the fund. The administrative set up of the AP consists of representatives from the government, local authorities, employer and employee groups, consumers' groups and individual contributors groups."

Briefs to the Commission from various members of the financial community rejected the Caisse, QMERS, and Swedish approaches because of the possible exercise of government control. Instead, they advocate allocation through the regular capital markets. Canavest House notes:

> "Public sector retirement savings should be allocated to investment uses through Canada's capital markets. They have a proven record as an efficient allocation mechanism.
>
> "In the same way governments buy professional services from the private sector supplies in the accounting, legal computer systems, advertising etc. areas, investment management services could be bought in a similar fashion. Investment objectives could be pre-defined. Fees could be established through a competitive bidding system."(Brief 180)

The Toronto Stock Exchange (Brief 219) supported this position:

> "Ideally, the Canada Pension Plan Investment Fund, to the extent it exists, should be managed on a competitive basis under contracts with investment managers in the private sector. Even if the government wishes to continue to purchase its own securities or those of another government, the Exchange recommends that those transactions be completed through the market process. The concept

of fair market value and an economic return which underlies private investment, whether done by private placement or public issues, should govern the investment of the enforced savings of Canada's labour force."

And in a similar vein, the Trust Companies Association of Canada states:

"The capital market in Canada is controlled by institutions in the private sector although strictly regulated by the public sector. The disciplines of the market, domestic and international, provide an important control on private and public sector spending, which the formula allocation of the CPP overrides. Participation by many private sector decision-makers in the allocation of pension savings by means of objective capital market prices is a more efficient resource allocation process, than a master allocation scheme of a board or a committee from the public sector operating outside of the discipline of the market."(Brief 361)

The Toronto Stock Exchange raises another important point for full funding of the CPP:

"Even if invested through the private capital markets, which the Exchange clearly supports should this route be taken, the plan would own significant proportions of corporate shares and other outstanding financial obligations. This raises serious questions as to how the CPP would appoint directors to corporate boards to represent the fund. What duties would such directors owe to the beneficiaries? Whose interests would they ostensibly represent? How would their duties differ from those of elected politicians when CPP beneficiaries and the electorate are virtually the same group? The lines of demarcation between private enterprise and parliamentary powers would be swept away."(Brief 219)

Answers to these serious questions were put forward by the Ontario Division, Canadian Union of Public Employees. It objected to the funnelling of CPP funds into the private corporate sector. Instead the brief made the following proposals:

"The public money accumulated through the fully funded Canada Pension Plan and public employee pension funds, instead of being used to finance the investment requirements of the private corporate sector, should instead be used in the public interest to:

"1. Repatriate the Canadian economy by using the Canada Pension Plan and public employee pension funds as an active investment vehicle to co-ordinate and direct an industrial strategy by directly buying the oustanding equity interest of foreign owned or controlled corporations in Canada.

"2. Pursue an industrial strategy at both the Federal and Provincial levels by using the fully funded CPP and public employee pension fund assets to invest directly in new physical plant and equipment in the manufacturing sector and the petroleum and natural gas sector through Federal and Provincial Crown Corporations.

"3. In this latter case, a competitive market rate of return should be guaranteed to the CPP and public employee pension plans to preserve the integrity of the fund for member beneficiaries and in order to meet the outstanding fiduciary responsibility.

"4. Establish a Heritage Fund whereby 10% of the assets of a trusteed pension plan of a foreign owned or controlled corporation would be placed with the CPP fund for investment in equities of foreign owned or controlled corporations or direct investment through a Crown Corporation."(Brief 101)

Conclusions on Full Funding

Having considered all the arguments, the Commission is not convinced that a case has been established for moving to the full funding of the Canada Pension Plan. There are a number of difficulties with the theory that pay-as-you-go social retirement income plans depress savings; but even accepting the validity of the theory the practical difficulties of full funding are extremely serious.

First, full funding would require such a large and almost immediate increase in the contribution rate that the existing relationship between government and private provision of retirement income would be badly dislocated. The equilibrium following the dislocation would leave the cost for the government-sponsored part much larger than the cost for the employer-sponsored part and the result, in terms of benefits, would be the same. The political difficulty of selling such an increase without an improvement in benefits is obvious. But to increase benefits would be to compound the problem.

Second, full funding would create such a large pool of assets, even in the next twenty years, that it is impossible to forecast what effect the investment of these funds would have on capital markets. Capital requirements for energy projects will be vast, but the speculative nature of many such investments precludes any generalized commitment of CPP funds to this aspect of economic development.

Third, control of the funds created by full funding through quasi-independent government agencies is no guarantee against future government intervention. However, to invest the funds either through government or private financial intermediaries still creates the problem of the exercise of the power which goes with ownership of assets on such

a vast scale. Concentration of control in this fashion could bring us to the pension fund socialism seen by Peter Drucker in The Unseen Revolution.

In the Commission's opinion, the Canada Pension Plan's prime role is not that of an economic tool to be used to control the Canadian economy. However, care must be taken in designing future funding methods for the CPP to recognize their possible impact on the economy, and to avoid major dislocations of capital markets.

THE COMMISSION'S ALTERNATIVE TO FULL FUNDING

1986 is the first year when some change in the CPP funding pattern is likely. Contributions will approximately equal benefit payout. Some decision has to be made about the future operation of the CPP. That decision will affect all future contributors to the plan and the financing of all participating provinces. The Commission is of the opinion that the Province of Ontario should initiate, as soon as possible, the following three major changes:

1. Adopt one fund basis for the CPP to continue into the future, and discard the other alternatives;

2. Make changes in the investment structure of the CPP fund;

3. Set future contribution rates.

The Commission appreciates that these measures require the concurrence of the other participating provinces and the federal government, and that negotiations will reflect the needs of other provincial treasuries as well as Ontario's. However, the Commission recommends the following course of action for Ontario:

1. Adopt as the CPP funding pattern the present Fund C

The Commission accepts the position that it is appropriate for a contributory social security retirement income plan to be on a pay-as-you-go basis. It rejects for the reasons stated above any thought of converting the CPP to a funded plan beyond the partial funding now in place and reflected in Funds A, B, and C. It doubts the wisdom of having created a partially funded plan in the first place, other than to provide contingency monies equivalent to one or two years' benefit payout. However, the capital accumulated has been lent to the provinces and the Commission believes it impractical to recommend that the provinces be required to repay the borrowed capital as they would have to (starting in 1991) under the Fund A design. On the other hand, to virtually release the provinces from interest repayment as is implicit in the design of Fund B seems to the Commission an unwise course if the provinces are to be accountable for their borrowing. Fund C's design

resolves these problems. It calls for continuation of the build-up in the fund from its present $14.8 billion to $36.1 billion in 1991,(23) assuming that contributions rise to pay-go rates starting in 1986. After 1991 the fund will continue at $36.1 billion in perpetuity, subject to some increase if its purpose is seen as a contingency fund for one or two years' benefit payout. By the year 2000, $36.1 billion will represent 1.6 times the annual benefit payout. In 1978, the fund of $14.3 billion is 10.5 times the benefit payout. However, the size of the stable fund continues to decline in proportion to the size of the benefits to be paid, so that by 2010 the fund represents only .7 of benefits and by 2030 only .1 of benefits.(24)

2. Make changes to the investment structure of the CPP fund

During the period between now and 1986, additional monies flowing into the fund under existing arrangements will be available for provincial financing. Between 1986 and 1991 the provinces will have a moratorium on part of the interest payments on monies borrowed. If contribution rates are increased above the pay-go rates, more capital from contributions will also be available for borrowing.

The Commission is of the opinion that the criticism of the existing investment structure is valid. It results in lower-than-market return to the fund. As a consequence, the best possible return is not available to benefit contributors; and the provinces are free to borrow monies without either the strictures of the regular capital markets or the constraint of a schedule for repayment of capital and payment of interest. Ontario taxpayers may have to pay more for capital borrowed by the province in the regular capital markets, but the benefits derived from the visibility of the cost of such borrowing and its traditional restraining effect should more than offset the increased cost in the future.

For these reasons the Commission recommends the adoption of the following changes in the investment structure:

As provincial obligations to the CPP fall due, borrowings by the provinces and interest payable on such borrowings would no longer be secured by the type of provincial undertaking now given. Starting in 1986 the first provincial "bonds" mature. As these mature they should be replaced by a new type of security: 20-year negotiable bonds issued by provincial Crown corporations, accompanied by a guarantee by the province and by a certificate of the provincial treasurer that the proceeds of the bonds are being used to invest in fixed assets, or to refinance outstanding debt used to finance acquisition of fixed assets of that Crown corporation. Whether such bonds are issued on a sinking fund basis or with a replacement schedule would depend on the nature of the issuing provincial Crown corporation, but there would be a fixed maturity date. From and after 1986, borrowings from the CPP of the

interest on the fund would similarly be secured by this type of negotiable security.

Interest on these bonds would be at market rates, set at the average rate in the twenty preceding trading days on outstanding long-term debt issued by or guaranteed by the province, denominated in Canadian dollars.

If it were thought undesirable for political reasons to set different interest rates for different provinces, then a monthly rate might be established, based on

a) the average of interest rates on all outstanding debt issued or guaranteed by all the provinces, other than Quebec, weighted according to their CPP contributions in the year of calculation; or

b) the actual interest rate on outstanding debt issued or guaranteed by the province involved;

with the provincial treasurer of the issuing province having the election between a) and b).

If in any month a provincial treasurer declines the funds available to the province, such funds would be invested in 90-day treasury bills until the province takes up the funds by issuing Crown corporation bonds. The treasury bills would be provincial where these are issued by the province and federal in all other cases.(25)

Several desirable effects would arise from this restructuring:

(i) By about the year 2000 all CPP funds would be invested in negotiable debt securities issued at market interest rates, on the security of real financial assets of Crown corporations.

(ii) A province would be forced to borrow money for its own requirements directly through the capital markets, with the constraints of market interest and the effect of borrowing on its own credit rating.

(iii) The CPP fund would be invested in securities which are negotiable and with a regular repayment schedule so that the capital and the interest on the fund may be utilized for payment of benefits under the CPP and will facilitate the transition to a Fund C pattern without a sudden demand on the provinces for interest and capital. The present opportunity for rolling over the obligations will not be available to the provinces. They will be obliged to come to

grips with the outstanding debt within the next twenty years, rather than postpone settlement indefinitely.

(iv) Criticisms of below-market interest rates and easy access to funds for provincial spending will be met and the whole structure will be subject to market conditions.

There will doubtless be adverse effects in terms of increased borrowing costs; but if the provinces accept the need for controlled spending, there should be little difficulty in persuading them that a Canada Pension Plan perceived by the public to be sound and well invested is worth the short-run difficulties.

Unless the CPP is changed to utilize full funding, the amounts available to the provinces will run out sooner or later, depending on the fund basis chosen. If the Fund C pattern proposed by the Commission is adopted, a fund should ultimately be maintained only for the purpose of securing benefits say, two years in advance, and will not be a source of funds for the provinces. With the CPP fund assigned this limited role, its size will diminish in relation to the expanding wealth of the country. In the long run the CPP will become essentially a pay-go program.

3. Set future contribution rates

The argument is frequently advanced that it is impossible to increase CPP contribution rates without at the same time increasing benefits. Such increases in contributions emphasize the subsidy from the present workers to those already drawing pensions who contributed less for those pensions. However, the Commission is not convinced there is an inevitable link between contribution rates and benefits, and therefore recommends there be no increase of benefits to go with the increased contribution rates.

The current 3.6 per cent contribution rate results in an increasing fund on a Fund C pattern until 1992. In order to accommodate improvements in retirement arrangements in the private sector and to avoid a faster build-up of the fund, the Commission recommends no change in the contribution rate until 1992, or more precisely, until contributions plus interest on the fund equal benefit payout.

When an increase in contribution rates is necessary, the Commission recommends a gradual phasing-in of increases to approximate the pay-go rates, with sufficient amounts accumulated above the benefit payout to maintain a fund equal to twice the year's benefits and administrative cost payments, three years in advance. Thus the contribution rates should be such that the fund on hand at January 1, 1991 will equal twice the amount required to be paid out for benefits and administrative costs in 1993.

The Commission experimented with various possible gradual increases in rates. Table D-17 in Appendix D shows the result of increasing the contribution rate to 4 per cent in 1985 and by .2 per cent every year thereafter, reaching an 8 per cent rate by the year 2000 and remaining constant thereafter. The result would be to continue the cash flow to the provinces until 2019 when contributions would again equal benefit payout; and a fund which would stabilize at $891 billion with a multiple of 7.27 times benefits. This projection confirms the Commission's reluctance to have the contribution rates increase before 1992 or to increase much above the Fund C rate because of the enormous fund build-up and its consequent problems. The Commission therefore recommends that instead of a gradual increase by a constant percentage, the contribution rate be set at predetermined intervals, say 6 years in advance, (to accommodate the CPP amendment machinery) by determining the pay-go contribution rate required to cover benefit payout with interest from the fund, at a point two years in advance of the year in which such payout is to be made. In this way, increases in the contribution rate are gradual, are fixed well in advance, and create a contingency fund sufficiently large to smooth any unexpected decreases in total contributions without providing any long-term capital which the provinces would be anxious to borrow. Actuarial evaluations should be done frequently enough to allow for changes in the contribution rates should it appear that the rates determined at 6-year intervals are insufficient to maintain the plan with the benefits covered three years in advance.

The Commission realizes that to maintain a 3.6 per cent contribution rate until 1991 when many people are expecting an increase early in the 1980s will open the way for strong pressures to increase benefits with a small increase in contribution rates. Such a course would undermine the long-term planning for the CPP. Any increase in benefits should be costed out to the ultimate payment time, as we have done for current benefits. Until the CPP matures, part of today's work-force can expect to receive more than it actually pays for (in addition to the benefit from real growth in the economy mentioned earlier) and it is easy to understand the demand for more of a good thing. But it must not be forgotten that if CPP benefits are to double, then the cost must also double; in that event a pay-go rate of 9.45 per cent in 2050 must double to 18.9 per cent.

NOTES

(1) Richard Osler in The Financial Post, September 10, 1977.

(2) Any monies not taken by the provinces, and contributions received from the Yukon Territory, the Northwest Territories, and for certain employees outside Canada, are invested in Government of Canada bonds.

(3) See Appendix D-5. Rate includes amortization of accrued liabilities over fifty years.

(4) Appendix D-5 shows the pay-go rates 1978 to 2050.

(5) A Report of the Canada Pension Plan Advisory Committee on the Funding Principles of the Canada Pension Plan, May 1976, p. 6.

(6) Ontario Ministry of Treasury, Economics and Intergovernmental Affairs, "The Economics of Financing National Pension Plans" (Toronto, 1977). See also "Saving or Consumption? The Role of the Public Pension Plan in the National Economy"; remarks to the Association of Canadian Pension Management: Mandate/78, by Tristram S. Lett, Senior Budget Advisor for Pension Policy, TEIGA (September 1977).

(7) Lett, ibid., p. 5.

(8) Arthur Donner and Fred Lazar, "A Review and Critical Analysis of the Economic Literature on Social Security," Volume V, Resource Study.

(9) See Appendix D, Table D-2 for contribution rates for proposed Funds D, E, and F, Royal Commission's projections with unfunded liabilities amortized over 50 years.

(10) See Appendix D-1 and D-3.

(11) See Appendix D-2 and D-4.

(12) 1,000 billion equals one trillion.

(13) Arthur W. Donner and Fred Lazar, "The Impact of Social Security Financing on the Capital Markets in the 1980s," Table 42; in Volume IX.

(14) Ibid.

(15) See Appendix D-4.

(16) Hon. Darcy McKeough, Speech to the Federal-Provincial Meeting of the Ministers of Finance, December 6 and 7, 1976.

(17) Ibid., p. 5.

(18) "The Management of Change in the Canadian Securities Industry," David C. Shaw and T. Ross Archibald, quoted in a speech by Yves Guérard of Pouliot, Guérard and Associates, Inc., "Pension Funds and Their Impact on the Direction of the Economy," 29 September 1978.

(19) Ibid.

(20) Yves Guérard, "Pension Funds and Their Impact on the Direction of the Economy."

(21) Paul Hickey, report on Ontario Municipal Employees Retirement System's Investments, August 9, 1973.

(22) Taxation and Fiscal Policy Branch, Ministry of Treasury, Economics and Intergovernmental Affairs, Government of Ontario, "Financing the Swedish National Pension Plans," August 1977.

(23) See Appendix D-3.

(24) See Appendix D-1.

(25) Only Alberta, Ontario, and Quebec now issue provincial Treasury Bills.

LIST OF TABLES

Table 1 - Fund C, Canada Pension Plan - Comparison of Critical Years and Pay-go Rates for "Normal Population" and Total Population including Baby Boom Excess 90

Table 2 - Effect on Fund C of Variations in Real Growth in Earnings 92

Chapter 8

Issues Relating to Benefit Features

COVERAGE

One obvious reason for establishing the Canada Pension Plan was the lack of work-related pension coverage for more than half the labour force. In addition, there was the knowledge that employment pension plans provided much less than full portability, so that many of those "covered" would not in fact receive retirement benefits commensurate with service and earnings in all jobs held during their working lives. By virtue of its universality and complete portability, the CPP was the vehicle of choice to ensure a degree of earnings-related pension income for all paid workers regardless of the nature or duration of employment with any one employer. Beyond that, the CPP provided coverage for the self-employed who, by definition, had little or no access to employers' pension plans.

It is not surprising therefore that the statistics show virtually complete CPP coverage of the Ontario work-force. A comparison of coverage by the CPP and private pension plans appears in Table 1.(1)

Table 1
Estimated Coverage in Ontario Under CPP and Private Pension Plans for Selected Years 1969-76

	Labour force annual averages				Covered by CPP		Covered by private pension plans	
		Employed labour force						
	Total labour force(a)	Paid workers	Self-employed	Paid workers and self-employed(b)	Estimated number(c)	Percentage of paid employment	Plan members	Percentage of employed paid workers
	(Numbers in thousands)							
1969	-	2,610	261	2,871	2,839	99	1,222	46.8
1973	3,509	3,015	267	3,282	3,273	99	1,446	47.9
1975	3,810	3,312	267	3,579	3,453	97	1,571	47.4
1976	3,931	3,384	271	3,655	3,504	96	1,608	47.5

a Includes employed and unemployed.
b Includes agricultural paid workers and paid workers, all ages.
c Estimates based on data in "Canada Pension Plan Contributors" various selected years, Health and Welfare Canada.

Source The Royal Commission on the Status of Pensions in Ontario, Harry Weitz, "Pension Coverage and its Potential in Ontario," Volume VIII, Table 1.

At the end of 1976, the latest year for which complete data were available, well over one and a half million workers (1,608,000) representing 47.5 per cent of the total paid workers in Ontario were covered by a private pension plan. Nearly all of these were also participants in the CPP. In that year, it is estimated that 96 per cent of the 3,655,000 employed paid workers plus the self-employed workers in Ontario were active members of the CPP. It is clear that the CPP is fulfilling its role of universality for nearly all paid workers. Those not covered fall into three categories:

- the unemployed;

- those whose annual earnings are no more than the Year's Basic Exemption ($1,100 in 1979);

- certain classes of workers excluded from coverage such as some agricultural workers, some casual workers, and some self-employed members of religious orders.(2)

The unemployed group is a fluctuating group with coverage resuming with employment. For the other two categories extension of coverage is difficult. The Ontario Federation of Agriculture pointed out that, although basically covered by the plan design, many farmers are unable to take full advantage of the benefits provided by the CPP because they have low cash incomes. If these fluctuate or are consistently below the YMPE, the farmers lose potential credits because the greater part of the value of their work is not measured in cash terms.(3) Their problem is similar to that of unpaid home-makers whose position is much more prominent in current criticisms of the CPP.

The Unpaid Worker

Since the Canada Pension Plan benefit is earnings-related and provides for both employees and the self-employed, it does not extend to those without earned income, in particular, housewives. There is a spouse's benefit on death of the contributor either before or after retirement, but no provision for voluntary contributions by housewives or other non-earners which would enable them to obtain pension credits. Social insurance principles, on which the CPP is largely based, traditionally limit protection to earnings. The risk shared by covered workers is the loss of employment income in retirement. Unpaid work is assumed to be inferior, or not work at all, or impossible to value. By far the largest group excluded by the application of these principles is the unpaid worker in the home.

The three major Canadian political parties have espoused as an election promise the extension of the CPP to those working in the home. At first blush the proposal is attractive and apparently forward-looking; but if one examines the ramifications of such a move, there are some

aspects which could actually undermine the present effectiveness of the CPP.

The Commission is cognizant of the undesirable position of many women who are now over 65 or approaching that age(4). However, it must not be forgotten that the position of these women has been determined by a far different social and labour scene than that in which any changes in the future to the CPP will take effect.

Our examination indicates that female labour force participation rates have grown to such a degree over the past two decades that few women in the future remain at home without children, or after children are in school. For most people, economic necessity or preference has required that both husband and wife be in the work-force. Those who will stay home permanently to raise children and never enter or re-enter the work-force are those whose economic position permits. They can expect to be provided for in old age by the additional savings and private arrangements of the marriage partner. If the marriage breaks down, the CPP now provides for a division of pension credits, and the non-working partner will probably enter or re-enter the labour force. If these assumptions are correct, then to extend the CPP on a voluntary basis on some notional value of work in the home will serve only to assist those who are unlikely to require economic assistance in retirement. In this sense, such a move can be said to be regressive in nature and therefore undesirable in the context of a social insurance scheme.

It will be useful to review some of the difficulties that would be created by a general extension of the CPP to non-workers.

Any arrangement which by design would protect pension rights only for those who could afford the contributions would distort the original social insurance concept of the plan, and would not serve the needs of many who may require pension coverage. If the measure is aimed at providing pension coverage to persons with disposable income, a vehicle other than CPP is already available: the spousal RRSP which permits tax deductible contributions of up to $3,500 a year, or as much as $5,500 in some cases.

To introduce the concept of voluntarism to a plan that is compulsory for persons in the work-force immediately creates two sets of plan members: those who must contribute, and those who may contribute if they wish. Such a situation might be considered undesirable on human rights principles. If the plan were to be compulsory for all, it would have to be altered radically to provide for collection of contributions, record-keeping, and work valuation. We would have a new universal scheme based on notional earnings. On the other hand, if the plan were voluntary for all, there would be no guarantee that those in or out of the work-force would continue to pay and maintain coverage. The scheme of shared contributions between employers and employees would be disrupted. If contribution levels were also voluntary, the problem

would be further compounded. Apart from the reduction in eventual pension due to periods of no contributions, there would be the risk of losing eligibility for disability and survivor benefits.

Accordingly, it is questionable whether it would be regarded as an improvement to change from universal coverage in the paid work-force to optional non-coverage, or coverage for those with greater financial resources who are not in the work-force.

Other implications would have to be questioned in any scheme which, though not wholly voluntary, included voluntary contributions:

a) If the home-maker is to contribute on the basis of imputed earnings, the level chosen would have to be minimal in order not to penalize the low-income person who is also carrying on family responsibilities; in other words, could we justify attributing higher earnings to the person doing his or her own housework and child care than are actually received by someone working as a cleaner or baby sitter for someone else?

b) If we assume the home-maker is self-employed, the contributions will be double those paid by the spouse; as a consequence, contributions may be harder to justify if the household budget is determined by only one salary;

c) If we assume the home-maker is an employee, then we must ask who will be required to pay the employer portion. To have the spouse do so is to re-emphasize for woman her traditional dependent role which is so strenuously being challenged today, and to create a tax on marriage. Conversely, should the double tax deduction be available to the spouse paying the employer portion? If we assume that the state will pay the "employer" portion, the inequity is compounded since all taxpayers, with or without CPP coverage for themselves, will be forced to support those with the financial means to avail themselves of this measure.

It is not perhaps beyond the ability of pension designers to come up with an arrangement which would answer these problems; but any proposals to include CPP coverage for home-makers who are not in the work-force should be assessed carefully on the basis of the real need of the persons to be covered. The Commission is concerned that the proposal attempts to meet a problem which is no longer of pressing concern. The Commission therefore is of the opinion that the Government of Ontario should resist any move to extend Canada Pension Plan coverage to unpaid workers, and should support continuation of the plan on its present compulsory and earnings-related basis.

THE CHILD-REARING DROPOUT PROVISION

While CPP coverage for homemakers as such may be impracticable, the Commission does see the need for a provision that recognizes the effect child-bearing and rearing has on the retirement income of the person who is forced to withdraw from the work-force on that account. The formula for crediting retirement benefits allows for some discontinuity of employment, but the working women whose career is interrupted by a period of raising young children will have a significant reduction in average earnings and a correspondingly lower retirement pension. Even if she is able to carry some part-time or temporary employment along with her family responsibilities, her contributory earnings record will almost inevitably suffer - not only for retirement purposes but also for eligibility for and amount of disability and survivor benefits. (This discussion applies equally to men, to the extent they assume child-rearing duties).

CPP benefits are calculated over a maximum 47 years, with a provision for "dropping out" or not counting in the calculation 15 per cent of the work history to a maximum of 7 years. This means that some allowance is made for unemployment, sickness, education or other dislocations in the worklife.

In this way, CPP pensions are designed to reflect a person's usual or "normal" earnings rather than a narrowly-defined average over the entire period during which contributions could have been made.

Child-rearing is one of a number of possible career dislocations for which the 15 per cent dropout was originally designed. However, women (and men with child-raising responsibilities) are left at a considerable disadvantage compared with other CPP contributors. Periods of child-rearing are likely to use up a large share of the 15 per cent allowance, often much more. Meanwhile, the risk of other career dislocations - sickness and unemployment, for example - remains. Accordingly, it is reasonable to consider a special dropout provision applicable to those whose child-rearing duties take them out of the regular labour force during part of the CPP contributory period.

A dropout provision for child-rearing was accepted in 1977-78 by all participating provinces except Ontario and British Columbia. As a result, the amendment - passed by Parliament and therefore reflected in the act (section 48, etc.) - has not been proclaimed. A parallel amendment was made to the Quebec Pension Plan with effect from January 1, 1977. The import of the child-rearing dropout proposal and especially Ontario's role in its rejection has led the Commission to examine this subject in some detail.

The child-rearing dropout would be applied before the standard dropout of 15 per cent. Application of this provision may best be explained by the following illustration:

At present: A person enters the work-force at age 20, makes CPP contributions for 7 years, then leaves to have children. Two are born, three years apart. The same person returns to the work-force at age 40 and makes CPP contributions for a further 20 years, leaving permanently at age 60. Earnings are recorded for pension purposes for 27 of a possible 47 years (age 18 to 65). After applying the general dropout allowance of 15 per cent, the net contributory period becomes 40 years rather then 47; the resulting pension, reflecting the person's 27 years of contributions, is 27/40 rather than 27/47 of the potential amount. Since the average Canadian woman in the labour force has a work history of about 25 years, this example is not untypical of CPP calculations for many who will divide their careers between paid work and child-raising.

As proposed: Potential contributory years would be reduced from 47 to 37; the 10-year dropout in the example is the period from the birth of the first child until the second child reached age 7. The 15 per cent general dropout then would be applied to the remaining 37 contributory years, leaving a net contributory period of 31.4 years. The person's 27 years of contributions therefore would produce 27/31.4 of the potential benefit instead of 27/40 as produced by the present formula. Restated as a percentage of the potential benefit (and substituting months as the act provides) the entitlement becomes 85.9 per cent, compared with 67.6 per cent without the child-rearing dropout.(5)

In principle, a dropout provision for general dislocations of work patterns does not differ from one applicable to a special type of dislocation such as child-rearing. With increasing participation by women in the labour force, it is valid to regard women first as workers and second as child-rearers rather than the other way around. Child-rearing then is seen as an interruption in the career, to be compensated for in the same way as sickness and unemployment.

The Business and Professional Women's Clubs of Ontario in their brief recommended the extension of a special dropout of up to 7 years in addition to the standard 15 per cent for any person obliged to be absent from the work-force for any reason, to cover patterns of work which the plan should recognize. They envisioned special circumstances involving:

"a) Necessary care of children beyond the age of seven years, e.g., because of disability or health problems, or lack of child care facilities for school-age children.

b) Care of dependents other than children (as defined by the Federal Income Tax Act).

c) Extended periods of vocational education or training.

d) Extended periods of illness or disability."(6)

The Consumer Survey carried out for the Commission indicates that about 70 per cent of the respondents favoured the child-rearing dropout provision, with women respondents (72.9 per cent) significantly more in favour than men (66.4 per cent) and younger people aged 18 to 34 (78.7 per cent) more in favour than those 35 and over (65.3 per cent). The dropout provision was advocated in every brief submitted to the Commission which dealt with the matter, and there were no dissenting voices at the Commission hearings.

When the dropout provision was considered by the provinces it was vetoed by Ontario(7) for the following reasons:

1. It requires a redistribution of benefits in the aggregate from single persons, childless couples and those who would not utilize the provision, to those who would use it. The CPP is based on the insurance principle and should not be used for redistribution of income.

2. It would create inequities because the provision would not be equally accessible to all mothers, some of whom would have to return to work because of economic necessity. A higher subsidy would result to a high earner than to a lower earner. Those not in the labour force for other reasons, such as caring for an elderly dependent, would not benefit.(8)

One answer to these objections lies in the difference between "insurance" and "social insurance" principles. That is, under regular insurance principles no subsidy or redistribution of income is envisaged, while under "social insurance" subsidies are entirely appropriate. It does not appear to the Commission that the CPP was designed on strict "insurance" principles at the outset. Three major subsidies now subsisting in the CPP design are discussed in Chapter 7. Social considerations were clearly present in the decision to provide partial pensions in the second year and full pensions after 10 years, although the recipients would have paid only a fraction of the cost. The arrangements for survivor benefits also provide for a redistribution of income in favour of married persons. In these and other structural features, the CPP reflects a clear intention to depart from conventional insurance principles in order to achieve specific social objectives.

Consequently, the crux of the argument is not whether the CPP should adhere to insurance principles, but whether there is justification for the subsidies and apparent inequities which would arise from the child-rearing dropout. On the question of subsidies, it is clear to us that the value to society of child-bearing and rearing is overriding

from any point of view, including that of single persons and childless couples. The emergence of woman as worker, entitled to recognition of her occupational skills, is of far greater significance to society than any loss to the single person and the childless couple by a redistribution in her favour. The inequities mentioned are in the Commission's opinion of less significance than the benefits to be gained for society as a whole. We doubt very much that there are many women who can now afford to stay home to raise their children. Finally, the regressive nature of the subsidy as between higher and lower earners is a problem common to every earnings-related feature of the plan, and cannot be an objection to the child-rearing dropout provision as such.

The provision has been estimated to increase the CPP costs by less than 1/3 of 1 per cent of contributory earnings by 2025. The Commission did not project the cost of this provision, but is of the opinion that its probable cost is far outweighed by the benefits to be gained. It should be noted however, that the cost is not easily ascertainable since the proposed provision is retroactive; that is, it will apply to all those who have left the plan for child-rearing since its inception, except for those already receiving a retirement pension.

Uniformity with the Quebec Pension Plan is highly desirable and should be maintained wherever possible. The QPP was amended to include the dropout provision when the CPP amendment was in process. An additional benefit in terms of uniformity would therefore accrue if the proposed dropout provision were now accepted for the CPP.

The Commission is persuaded that the child-rearing dropout is an important step toward the recognition of women as a vital part of the work-force. Their particular work patterns, reflecting the role of child-rearing in society, should be accommodated in the Canada Pension Plan so that women are not unduly penalized by their necessary and socially productive absence from the work-force. The Commission, therefore, recommends that the Government of Ontario approve the amendment to allow the child-rearing dropout provision to be put into effect without delay.

SURVIVOR BENEFITS

We have commented on the poor economic position of women just approaching 65, or over 65 at the present time. These are the people who are caught in a period of inflation and changing structures in society. The original CPP design reflected the traditional roles of the husband as breadwinner and the wife as a non-working dependent. At first therefore, the plan provided a survivor benefit for the widow of a deceased contributor in the form of a pension based on roughly 60 per cent of the contributor's entitlement. The same benefit was provided for a widower, but only if he was <u>dependent</u>. In other words, a widow was assumed to be dependent; in the case of a widower, dependency had to

be proved. That element of discrimination was subsequently removed, leaving in question the adequacy of surviving spouse pensions for both widows and widowers.(9)

The 60 per cent level of survivor pensions reflects the judgment that a single or widowed person living alone needs more than half the amount required for a married couple living together. This view is adopted by the Commission in its assessment of adequacy levels.(10) Many labour groups advocated in briefs to the Commission that the percentage be increased to 75 per cent, but in support of that percentage offered only the general argument that since more than 50 per cent of women over 65 were below a poverty line, CPP survivor pensions were inadequate.

In the Commission's view it is necessary to look at the composition of the group over 65 to determine the validity of that argument. An analysis of sources of income for persons aged 65 and over in Canada for the year 1976, taken from income tax returns, shows that men relied on Canada Pension benefits for only 6.8 per cent of their income for tax purposes and women for only 4.5 per cent.(11) To give some idea of the magnitude of these incomes, the statistics show that nearly 28 per cent of women's incomes was derived from the basic Old Age Security Pension. For men, the basic OAS pension represented about 18 per cent of income for tax purposes. These percentages, which are relevant to a discussion of income adequacy (and poverty lines) in 1976, could hardly have been affected significantly if CPP survivor pensions had been based on a 75 per cent rather than a 60 per cent formula. It must be remembered that all poverty-line analyses that have been used to support proposals for higher CPP survivor pensions relate to an over-65 population in which CPP pensioners accounted for only a small, though increasing minority. By 1976 only a very few were in receipt of retirement pensions at the full rate. If we were to look at the position of those few individuals and how their survivors might fare, it would be difficult enough to argue that poverty would be overcome by providing an extra 15 per cent of their very modest pensions. However, the plight of the elderly population as a whole - especially women - could have had very little to do with the CPP survivor pension formula.

Furthermore, the CPP should not be treated in isolation as a source of income. It is important to see Canada's retirement income sources working together to provide income for survivors. Old Age Security with the GIS and GAINS, as well as the CPP, combine to provide a standard of adequacy which in the Commission's opinion requires only a slight upward adjustment.(12) This adjustment can best be made through a program based on actual need. The Commission also favours the retention of the 60 per cent ratio for the survivor benefit to fit in with its assessment of the correct relationship between the amount required for a single person and that for a married couple. (Note that a slightly higher ratio [two-thirds] is required in government programs for adequacy at minimum income levels. See Volume I, Chapter 6).

For the future, it is perhaps significant that projected expenditures on the unindexed portion of survivor benefits rise very slowly betwen 1982 and 1990, with the percentage actually falling for the year 1984 and then resuming a slow increase.(13) Survivor benefits include those payable both to survivors of retired contributors and of those dying before retirement. Some of the increase in the benefits will result from higher benefits paid to retired contributors as the plan matures and full benefits become payable. It is therefore arguable that survivor benefits will actually become less significant as more women join the work-force and accumulate retirement benefits in their own right.

The Commission therefore recommends that the survivor benefit payable to the survivor of a deceased retired contributor continue to be approximately 60 per cent of the pension benefit of the retired contributor, and that the Government of Ontario resist any extension of the existing survivor benefits relating to deceased contributors.

DIVISION OF PENSION CREDITS DURING MARRIAGE

As we have seen, the design of survivor benefits in the Canada Pension Plan implies dependency in the marriage relationship. As more women enter the work-force and earn pension entitlements in their own right, the overall importance of survivor entitlements will be reduced. An amendment to the plan, effective in 1978, provided for the splitting of CPP pension credits on termination of marriage. The more radical proposal of a division of credits during marriage was discarded. If we examine the two proposals we can see how the differences in underlying philosophy affect the result.

With credit splitting on dissolution of marriage, the basis is the same as for other types of support. On divorce, the spouse (usually the wife) is losing a source of retirement income. Therefore it is reasonable to treat the potential entitlement as a present asset to be taken into account in settling future support arrangements. The mechanism is available upon application within three years of dissolution. It may be expected that the exercising of this right to apply will increasingly be the subject of negotiation between the parties at dissolution.

Credit splitting during marriage however would not be based on a support obligation, but rather on the concept of marriage as an economic partnership in which both spouses work - in the work-force or at home - to create a joint asset. In general the terms the proposal would work as follows: where only one spouse works in paid employment the CPP credit would automatically be split, with half transferred to the credit record of the home-maker spouse. Where both spouses work, one-half of their respective credits would be transferred to the credit record of the other. At age 65, each would receive a retirement pension based on half the combined pension credits. Unless both spouses contributed on

the maximum YMPE continuously, the higher-paid and more regularly employed of the two would be relinquishing a benefit to the other spouse. This appears to have an element of fairness between the spouses, in that joint sacrifice is made for the creation of each of the two pensions. By comparison to the present situation, however, it means that since women are generally employed at lower salaries, there would be a redistribution of pension entitlement away from the male spouse toward the female. Taken together, it may also mean that the family unit will be worse off than if the couple had accrued separate pensions. Where one spouse is 65 and the other under 65, a CPP pension based on one-half the joint credits may be too small to allow retirement of the first spouse until the second also reaches 65.

These problems of equity and feasibility, together with questions about the nature of changes in attitudes and practice that are likely to flow from Ontario's Family Law Reform Act, suggest to this Commission that no immediate steps should be taken to extend the splitting of CPP credits to apply to all married contributors. At the same time we reiterate our approval of a less traditional attitude toward dependency in the married relationship. In the continuing studies of the CPP and its effectiveness in achieving social objectives, we trust it will be possible to give more tangible expression to the principle of economic equality for individuals within the family unit.

The Cofirentes report(14) made recommendations for QPP survivors' benefits which embrace this principle more whole-heartedly than perhaps is warranted at this time. The recommendations(15) contemplate a survivor's benefit of an increased amount but of limited duration, and payable only between the survivor's age 35 and 65.(16) The duration of payments would depend on the presence of dependent children.(17) Where there are no dependent children the survivor's pension would cease after one year. Otherwise, payments would continue during the dependency of the children or, where the children are very young, for three years after the youngest child is seven.

The reasoning seems to be that the survivor's benefit is to assist during a period of adjustment rather than to provide permanent income replacement. Similarly, the recommended increase of the death benefit from the present 10 per cent to 15 per cent of the YMPE would fit in with that concept.

Particularly important is the Cofirentes recommendation that no survivor's annuity be paid after age 65. At that time presumably the survivor is expected to rely on OAS, GIS, and any QPP pension earned as a contributor. This Commission cannot support these recommendations in light of present-day realities, particularly the position of the unpaid home-maker or the low-paid worker with broken service patterns under the CPP/QPP. Rather than reducing utilization of GIS for this group, adoption of these proposals would increase it. Benefits limited to a period of adaptation to a new lifestyle might be sufficient for the

younger survivor, but not for someone age 70, for example, who can hardly be expected to adapt readily to the loss of both spouse and spouse's retirement income. Such changes as those recommended for those 65 and over would require phasing-in over a number of years. In any event, it is clear to us that the benefit structure of a social insurance program must recognize the realities of today's individual and family relationships. While it is desirable to anticipate and accommodate significant long-run developments such as those that are now changing the economic position of women in the family and the work-force, it is not the proper function of the Canada Pension Plan to force the pace of this evolutionary process and to create hardship for those who do not fit the emerging pattern.

LEVEL OF BENEFITS

At present the Canada Pension Plan provides a retirement benefit of 25 per cent of average adjusted pensionable earnings. Pensionable earnings relate to the Year's Maximum Pensionable Earnings (YMPE) - currently rising at 12-1/2 per cent each year until it reaches the same level as the Average Industrial Wage (AIW) after which the two will rise in tandem. Thus the goal of the CPP is often expressed as a pension equal to 25 per cent of earnings for a person at the Average Industrial Wage level. Together with OAS equivalent to about 15 per cent of the AIW, government program benefits are designed to provide about 40 per cent of the AIW in gross terms.

The Commission's net replacement ratio analysis(18) shows that for a person retiring at the Average Industrial Wage level at the end of 1978, the combination of all government benefits for a person in Ontario including CPP and income tax effects resulted in "available income" having a net replacement ratio for a single person of 50 per cent and for a married couple, both over age 65, 75 per cent. For those earning less than the AIW the net replacement ratios were much higher, and in fact exceeded 100 per cent for both single and married couples both over 65 earning the minimum wage. Any private pension benefits would be in addition to these benefits except to the extent that they were integrated with the CPP or served to reduce GIS and GAINS benefits.

There have, however, been proposals in recent years for increasing the benefit structure under the CPP/QPP. Two such proposals are representative of different approaches.

1. The Canadian Labour Congress, in its 1978 policy statement,(19) made the following recommendation:

> "...that the Old Age Security and Guaranteed Income Supplement should combine to provide all Canadians over 65 with an income which is above the poverty line. In addition, the basic benefit under the Canada Pension Plan should be increased to 50 per cent of

earnings up to the average industrial wage. The Canada Pension Plan and Old Age Security should combine to provide workers with 75 per cent of their pre-retirement earnings if they earned the average industrial wage. The percentage should be higher if their pre-retirement earnings were below the average industrial wage, and the percentage should be lower if pre-retirement earnings were above the average industrial wage. We also recommend that the CPP be amended so that actuarially reduced benefits would become available at age 60 and so that surviving spouses over 65 could claim 75 per cent of the retirement benefit to which a deceased contributor was entitled rather than 60 per cent as is now the case. Finally, new benefits under these programs should grow with the average industrial wage, and once benefits have begun to be paid to a retiree, they should be indexed to the Consumer Price Index.

"The benefits we are proposing are a substantial improvement over the current situation in Canada and they will guarantee all Canadians an adequate retirement income. But, they are not excessive in relation to the objective to be achieved, or by comparison with the standards already established in Europe. Furthermore, while these proposals may eliminate the future need for some employer based plans, they in no way undermine benefit credits already earned and they still leave room for employer based plans to take care of early retirement and the supplementary income needs of workers whose pre-retirement earnings are above the average industrial wage."

The CLC bases its argument on the shortcomings of private pensions in providing "adequate retirement incomes to all Canadians" and cites as specific shortcomings the lack of universal coverage, less-than-immediate vesting, inadequate benefit levels, and lack of indexing. All of these shortcomings are eliminated in the design of the Canada Pension Plan.

The CLC cites three objectives it feels should be adopted by "public retirement income schemes":

- no retiree will have to live in poverty;

- 75 per cent of pre-retirement earnings should be paid to a retiree from public sources of retirement income;

- the real value of public retirement income must be guaranteed by automatic indexing to the Consumer Price Index.

The CLC acknowledges that there is real value to retirees from Ontario's tax credits and GAINS benefits, but prefers a national system to a provincial one to allow for the high mobility of the labour force.

It also views programs such as Ontario's as a reflection of the general inadequacy of retirement income.

Emphasis is also placed on the need to consider OAS, GIS, and CPP as a system of public retirement income. It sees reliance on the GIS for non-workers, but prefers the use of the OAS and CPP to meet the goals for retired workers, since these provide income "as of right."

The CLC proposal was supported by a number of union groups in their submissions to the Commission. The original CLC proposal called for an increase in CPP benefits to 75 per cent of average adjusted pensionable earnings. This has since been reduced to 50 per cent, which coincides with a proposal made in a study conducted by Martin O'Connell M.P. in 1975.

2. The Cofirentes Report (1978) recommended changes to the Quebec Pension Plan which are of importance to the structure of the CPP in light of the need for parallelism between the plans. The report recommended:

- that retirement benefits be increased to 50 per cent on pensionable earnings based on the lower half of the YMPE and remain at 25 per cent on the upper half of the YMPE, resulting in a rate of 37-1/2 per cent for persons earning at the level of the YMPE;

- that the increase recommended take effect without a transition period and apply to all retirement benefits now in payment as well as in the future.

The Quebec committee, like the CLC, recognized the interplay of the QPP with the GIS and the OAS. The objectives to be met by the Cofirentes proposals were:

- to eliminate from the GIS all but non-workers and workers with inadequate work histories;

- to eliminate the need for workers earning below the average industrial wage to belong to private pension plans;

- to ensure that the worker at the minimum wage level would receive 90 per cent of pre-retirement after-tax income from the combined OAS and QPP.

Cofirentes also recommended that the OAS continue unchanged; that the indexing of QPP benefits to the Consumer Price Index continue; and that the YMPE ceiling for employers' contributions be removed so that employers would contribute on the total earnings of the employee.

Should the Level of Benefits be Increased?

Part of the answer to this question depends on one's view of the role of government in retirement income provision. We have noted elsewhere two general objectives:

1. to ensure that no one lives below a minimum standard acceptable in our society;

2. to replace a measure of pre-retirement earnings, and thereby assist individuals to maintain their living standards.

At present the obligation of fulfilling the first principle rests directly with the government and is dealt with in Ontario by the OAS with the GIS and Spouse's Allowance, income tax exemptions, Ontario Tax Credits, GAINS, and free prescription drugs, as well as other types of subsidy. The Commission has found some inadequacy in the combined provisions and has recommended improvement. For a full discussion see Volume I of the report, Chapter 6.

Analysis shows that "available income" from government programs including the CPP, for the retired person age 65 in Ontario who has worked at the minimum wage throughout his working career, will provide net replacement ratios as follows:(20)

Single person	87.9 per cent
Married with spouse under 60	102.7 per cent
Married, spouse 60-64	137.9 per cent
Married, spouse 65 and over	145.3 per cent

The Commission is satisfied that net replacement figures are much more meaningful than gross replacement ratios. We therefore question the usefulness of the analysis in the brief of the CLC based on gross figures. The brief acknowledges that aiming for replacement ratios defined on a pre-tax basis will raise the replacement ratios defined on an after-tax basis, but makes no attempt to assess the difference or to take into account other income items.

The CLC proposal also advocates increasing the OAS as well as the CPP. The combined increases would greatly increase the net replacement ratios for all categories of retirees and, in the opinion of the Commission, would result in "over-insurance" with consequent disincentives to save and an unnecessary drain on the taxpayers. All of the programs providing income except GAINS, which operates on a guaranteed minimum basis, are indexed to the Consumer Price Index so that the retiree is fully protected from inflation. While it is true that the OAS will fall behind in terms of the percentage it bears to the average industrial wage, the Commission is against increasing a universal payment in a scheme based fundamentally on meeting a need. It therefore favours an increase in the GIS and does not support the principle that earned

rights or absolute entitlement, apart from need, are a more valid criterion for a government program.

The Cofirentes report also neglects to consider the effect on net replacement ratios of the increases to the QPP it proposes for workers at the lower half of the YMPE. It is true that the combined operation of the programs will prevent a 50 per cent increase in the overall effect of QPP payments because there will be a tax-back effect on GIS payments; but the already high net replacement ratios would be much increased if the same approach were applied to CPP benefits for recipients in Ontario.

The Cofirentes report recommends no change in the OAS, and in effect proposes a decreased dependence on the GIS and an increased dependence on the QPP earnings-related benefits. The Commission is in accord with this approach, but would recommend that any such adjustment between the two programs should first be assessed for the effect on net replacement ratios. It should be noted that some GIS payment is now payable to every category of retired person with pre-retirement earnings up to the average industrial wage.(21) For example, the worker aged 65, retiring January 1, 1979, who had worked at the average industrial wage, would receive monthly GIS benefits depending on his or her marital status as follows:

Single person	$ 28.28
Married with spouse under 60	125.88
Married with spouse 60-64	114.15
Married, spouse 65 and over	120.30

The Cofirentes approach therefore would not eliminate the GIS for all those receiving only government benefits including the QPP.

The Commission has recommended some increases in the GAINS level so that combined government programs in Ontario would ensure that no one lives below a minimum standard acceptable in our society.

The second goal of continuing in retirement one's pre-retirement standard of living should then be examined to determine if it is being fulfilled, and if not, by whom action should be taken.

The CLC postulates that this goal would be fulfilled if retired workers who earned at the average industrial wage received 75 per cent of their pre-retirement earnings. A 70 per cent portion is often suggested as ideal by those in the private pension industry. Higher percentages would be reasonable for those earning below the AIW.

Looking again at the Commission's net replacement ratio analysis we find net replacement ratios of "available income" for workers retiring in Ontario, January 1, 1979:

	Worked at the YMPE	Worked at the AIW
	(Per cent)	
Single person	63	50
Married, spouse under 60	76.9	61.2
Married, spouse 60-64	91.4	72.6
Married, spouse 65 or over	94.9	75.4

Again, while repeating that net replacement is more meaningful than gross replacement, the Commission is of the opinion that for the married couple(22) the goal of the CLC is already satisfied, and that it is only the single person who fails to reach that goal. The annual "available income" of the single person working at the AIW and retiring January 1, 1979 would be $5,393. In addition to this after-tax income, a person will usually have some accumulated savings whose capital value will not serve to reduce any entitlement to income supplements. Income from those savings or other sources will add to "available income," since there is only a partial tax-back for income-tested government benefits.

Therefore the Commission concludes that the existing government programs in Ontario have virtually fulfilled the second goal without any reference to employment pension plans. Because the Commission believes that the individual is responsible for choices in retirement beyond a minimum standard of adequacy and that society should not be compelled to make provision beyond that level, the Commission does not favour increasing benefits in the CPP from their present levels. That is not to say that government has no further role in retirement income provision but rather that a social insurance scheme, based on a group pooling principle - with the inherent cross-subsidies and funding difficulties we have seen now existing in the CPP - should not be extended beyond the provision of a minimum standard of adequacy and the range of replacement income now provided.

The Commission therefore recommends that the Government of Ontario resist any move to increase the existing levels of retirement benefits and survivor benefits in the Canada Pension Plan.

Integration of Employment Pensions with the CPP

Methods by which an employment pension plan may be co-ordinated with CPP benefits are discussed in Volume II, Chapter 11. In the view of the Commission, any such integration should continue to be a matter for voluntary action by plan sponsors and their employees, subject only to a degree of regulation by the supervisory authorities. Any accommodation for employment pension plans within the structure of the compulsory government social insurance program (as in the United Kingdom) would accomplish little if anything by way of improved benefits to employees, and in fact has few advocates in this country. Accordingly, we do not recommend any change that would permit opting out of the Canada Pension Plan where an employment pension plan offers equivalent or better benefits.

RETIREMENT AGE

Canada's government programs for retirement income all commence at age 65 with the exception of the Spouse's Allowance, which commences at age 60. In the latter case however, one spouse must be aged 65. Ontario's GAINS program, tax credits and health assistance are also geared to age 65. Under the Income Tax Act the age exemption is granted from age 65.

History reveals how the pivotal age for the elderly was once 75, later 70, and how it gradually fell to age 65. By the early 1970s there was a trend to earlier retirement ages in employment pension plans, especially through collective bargaining. In many industries today the average age of actual retirement appears to be closer to 62 than 65; it may be even lower in the case of plans have a "thirty and out" retirement provision. More recently, we have seen evidence of public support for "flexible" retirement policies - mainly directed against compulsory retirement and toward greater freedom of individuals to continue working, according to their capacities, beyond some assumed "normal" retirement age. These two trends, toward earlier and later retirement, are not contradictory if, as seem obvious, they are reflections of the same general desire of workers to have a greater choice of retirement age. To what extent people will actually take advantage of flexible retirement provisions depends, in part at least, on economic conditions from time to time, and the individual's expectations of retirement income. A continuation of inflation in particular might be expected to lead to a slowing of the early retirement trend and an increase in the number of postponed retirements.(23)

From our consumer survey we find that 60 per cent of the respondents favoured a CPP pension payable on retirement but in a reduced amount for those under age 65. About 70 per cent thought the current practice of paying CPP benefits to those over age 65 who were still working should continue.(24)

The Commission therefore considered the possibility of an option for earlier payment of CPP benefits on an actuarially reduced basis at any age between 60 and 65.

There are a number of issues to be addressed in deciding whether there should be some reduction in the age at which CPP benefits are payable.

a) Social Insurance or Not?

The CPP is part of Canada's social security design, combining with the OAS and the GIS to provide a minimum income floor. The unions and others, on the other hand, see the CPP as a strictly earnings-related, contributory scheme where benefits are bought by contributions and are therefore payable as of right. The CPP is established on a group

principle and embraces several cross-subsidies with an intergenerational subsidy supported on a "social compact" basis between present workers and those of the future.

If the CPP is social insurance, designed to meet "need" then it should be treated as an integral part of other social insurance programs and benefits should be available at the same age as the other programs, with social assistance answering needs of those below the established age (now 65).

If the CPP is an earnings-related scheme under which benefits are payable as a right by virtue of contributions, then we move closer to the private employment pension design and are caught up in the arguments for "flexible retirement."

b) Retirement from Gainful Employment

U.S. social security, normally payable at age 65, is now available at age 62 with a permanent reduction, but is subject to an earnings test(25) on the basis that what is provided is replacement of income lost through withdrawal from employment. The earnings test applies until age 72.(26) In emphasizing income replacement the U.S. system is closer to a true social insurance scheme than is the CPP.

Originally, both the CPP and the QPP imposed an earnings test for qualification for benefits at age 65 to age 70. The test permitted annual earnings up to $900 before applying the reduction formula. Administrative difficulties and social pressures led to removal of the earnings test for the CPP in 1975 and the QPP followed in 1977.

Employment pension plans commonly do not provide benefits until an employee actually leaves the employer's service; in most cases pension payments are suspended if the person is rehired. Otherwise, retirement and earnings tests are rare, especially for those taking their pensions at or near normal retirement age. However, employment or earnings tests have appeared in a few large industrial plans in conjunction with certain highly subsidized early retirement provisions (unreduced accrued pensions plus substantial bridging supplements). Comparable early retirement provisions are found in the federal Public Service Superannuation Plan, but without an earnings test. Such arrangements are vulnerable to criticism on the ground that income provided for retirement is often used instead simply to enhance the living standard of some who are still regularly and fully employed. Ethical considerations, however, take second place to the formidable administrative problems that are associated with any test of retirement or earnings. Where such tests have been instituted, their efficacy is difficult or impossible to assess in a reliable way.

The controversy continues over the purpose of income from pension plans. If it is replacement of income lost by retiring from employment,

an earnings test is required. If it is earned as a right, the pension should be available any time at the option of the earner, subject to actuarial reduction. If it is part of a general social design, it should be available at an age suitable to society, without reduction.

c) Bridging the Gap

Many employment pensions are integrated with CPP benefits; some are also integrated with OAS. Where early retirement is available, many plans provide a "bridging supplement" so that amounts equivalent to the benefits from the government programs are paid by the pension plan until the retiree reaches age 65. This "gap" would be of concern if early retirement were elected by a worker at age 62 and the CPP pension were available on a reduced basis. The "gap" could be financed from minimal personal savings; then at age 65 the retiree could expect GIS to replace the amount formerly covered by personal savings. It might be possible to impute the unreduced value of the CPP to the retiree in calculating the GIS entitlement, but the result could be to put the retiree below the minimum floor of adequacy which the social insurance package as a whole was designed to deliver. Whether this choice is seen as different from electing early retirement with a reduced pension under an employment pension plan depends on whether one considers the CPP an integral part of a social insurance system.

d) The Right to Choose Retirement Age

If retirement is in fact an individual responsibility, it follows that the choice of time for retirement also belongs to the individual. Current social pressures along these lines are now concentrated on the upper age restrictions, but flexibility is sought at both ends of the scale. The desirability of early retirement is underlined by the inability of those just under 65 to obtain employment. An argument made to the Commission by miners with shortened life expectancies is also compelling. The Trust Companies Association of Canada (Brief 361) postulates a difference in the right to choose:

> "Retirement under government social programs should reflect society's definition of retirement, as distinct from retirement based on employment factors and an individual's own circumstances."

The question again turns on whether the CPP is part of the government social program. If it is, then a definite age should be maintained; the unemployed and those unable to work are more properly covered by disability insurance and social assistance.

e) The Right to Accrue Increased Benefits

If CPP benefits were available at age 62 on an actuarially reduced basis, should the postponement of payment to, say, age 68 mean an increased benefit payable at that time? Postponed payment would result

in sufficient savings to the plan to provide an increase in benefits. However, to the extent that such a provision would increase the work-force participation of those 65 and over, it may not be desirable in a period of high unemployment, particularly in the younger age groups. On the other hand, with the improving health and life expectancies of the group 65 and over, is it better to adopt measures which will extend the period of productivity for this age group?

f) Cost Factors

As well as the social cost of shortening the productive working lives of workers, reducing the retirement age for the CPP would also mean a loss of plan contributions of those workers who retired early. If an earnings test were reinstated, on the theory that the Plan is designed to provide replacement income in retirement there could be a greater demand on the GIS if other sources of income were not available to "bridge the gap." If the age were reduced, accompanied by an actuarial reduction in benefits, there would be no extra cost to the plan other than loss of contributions. The economic effects of reducing the age of entitlement for the CPP is discussed by Pesando in his paper, "Trends in Retirement Age and the Implications for Pension Planning," found in Volume VIII. The Commission's projections of savings to be gained by the reinstatement of the earnings test formerly in force in the CPP are discussed in Chapter 6 of this volume.

Conclusion

After considering all the issues, the Commission is of the opinion that the CPP is part of Canada's social security scheme and therefore any change in retirement age should be in concert with the eligibility age for other other parts of the scheme. Since eligibility ages are all now at age 65 there should be no change in the CPP at this time. The Commission does not see a return to the earnings test, despite the possible cost savings, if the age is maintained at 65. Should the age be lowered, use of the earnings test might again be considered.

COMPARISON OF SOCIAL SECURITY IN THE UNITED STATES AND IN CANADA

Often the U.S. Social Security is pointed to as being much superior to the Canadian system. The U.S. Old Age Security and Disability Income program (OASDI) parallels Canada's Old Age Security combined with the CPP. A comparison of the cost of the respective programs shows the following:

Table 2
Social Security Expenditures as Percentage of Earnings Base, Canada and United States

	Canada			United States
	CPP	OAS	CPP + OAS	OASDI
	(Per cent)			(Per cent)
1980	2.86	4.93	7.79	10.11
1990	4.61	4.14	8.75	10.58
2000	5.73	3.60	9.33	10.97
2025	8.83	3.39	12.22	16.40
2050	9.45	2.30	11.75	16.17

Source Table prepared for the Royal Commission, based on the Commission's most probable assumptions for CPP expenditures. U.S. figures taken from Table 6 in an article in the Social Security Bulletin, March 1978 of the U.S. Department of Health, Education, and Welfare, by A. Haeworth Robertson, former Chief Actuary of the Social Security Administration.

Why Is the Cost of the Canadian System Less Than That of the U.S.?

First, the OAS in Canada is indexed to prices, not to wages and salaries. This accounts for falling percentages when OAS is expressed as a percentage of CPP contributory earnings.

Second, the U.S. system was amended in 1977 to decouple the benefit formula for indexing, thus resulting in lower replacement ratios after 1981 and a more stable cost structure.

Third, the U.S. benefits are higher. In 1979 the earnings ceiling in the United States was $22,900 compared with $11,700 for the YMPE in Canada. The maximum monthly benefit under OASDI in 1979 was $550 for a single person, $825 for a couple, and $963 for a family. This compares with $385 single and $552 for a couple or a family in Canada. A fairer comparison may perhaps be obtained by taking someone with previous annual earnings of $14,000. The U.S. monthly benefit in 1979 was approximately $492 single, $738 couple, and $861 family maximum. Even allowing for the lower average of earned incomes in Canada, the U.S. benefit level is superior, and not solely because of the provision for eligible children.

In the United States, retirement may take place at age 62, with 80 per cent of the pension otherwise payable. This rule allows pensions to start earlier and is more generous than an actuarial equivalent basis. In the event of death, the U.S. benefits are generally better than in Canada, as follows:

	Percentage of primary insurance amount
Spouse, age 65	100
Spouse, age 60	71.5
Disabled spouse, age 50	50
Spouse with child	75
Each child	75
Dependent parent	82.5

The United States has two features that are less generous:

- The earnings limitation up to age 72; and

- The minimum pension of $122.00, which is less than Canada's OAS. On balance, however, the U.S. benefits are greater than those in Canada.

The U.S. percentage costs are also greater because the U.S. self-employed worker pays only 150 per cent (or less) of the contribution rate paid by employers and employees.

Finally, the present U.S. population is on average older than that in Canada and projections indicate that this difference will continue.

Table 3
Ratio of Population Age 65 and Over to Population Age 20-64, Canada and United States

	Canada less Quebec			United States		
	Males	Females	Combined	Males	Females	Combined
			(Per cent)			
1975	13.9	17.7	15.8	15.8	21.8	18.9
1980	13.9	18.2	16.1	16.0	22.6	19.4
1990	14.6	20.3	17.5	17.0	24.4	20.8
2000	15.3	21.4	18.3	17.0	24.7	20.9
2025	23.1	32.0	27.5			32.6
2050	25.9	36.7	31.3			33.2

Source Table prepared for the Royal Commission based on the Commission's dependency ratios (Appendix B-2) and U.S. comparisons provided by Laurence Coward.

The ultimate U.S. ratio for males and females combined is estimated to be 34 per cent. The present age-dependency burden in the United States will not be matched in Canada until just after the year 2000. Both the United States and Canada show strong effects of the baby boom on the age distribution, but the Canadian figures remain below those in the United States at all times.

These results depend on the assumptions made as to the future. For example:

- U.S. assumptions show mortality decreasing by 18 per cent from 1976 to 2050, a smaller decline than in Canada.

- U.S. fertility is assumed to decline to 1.65 in 1980 and then rise slowly to 2.1 by the year 2005; lower rates than in Canada.

- U.S. disability incidence is assumed to increase, reaching a level in 1986 that is 33 per cent above the 1977 level; no such adjustment was made in Canada.

Thus we see that a superficial statement that U.S. social security benefits are better than Canada's has little validity. Comparative costs show U.S. costs are greater and these in turn are due to three factors: more generous benefits, a population with a higher average age, and more conservative actuarial assumptions. A precise comparison would involve measuring equal benefits against the cost structure or equal costs against the benefit structure.

APPEALS PROCEDURE

There are two procedures for appealing CPP determinations according to the nature of the question involved, basically whether the question involves contributions or benefits. If an issue is raised with regard to liability for making a contribution or the amount of contribution, the employee or employer may apply to the Minister of National Revenue for a determination (section 28). The decision of the Minister may be appealed to the Pension Appeals Board (section 29). The members of the board are appointed by the Governor-in-Council and must include a chairman and a vice-chairman, each of whom must be a judge of the Federal Court of Canada or of a superior district or county court of a province (section 85). The Board may hear appeals at any place in Canada. An appeal lies to the Supreme Court of Canada with its leave (section 30).

If eligibility for a benefit or the amount of a benefit is raised, an applicant may appeal to the Minister of Health and Welfare (section 83). An appeal may be taken from the Minister's decision to the Review Committee (section 84). The Review Committee consists of three members, one appointed by or on behalf of the applicant, one on behalf of the Minister and a third chosen by the two others. These members receive no remuneration for such duties. A decision of this Committee may be appealed to the Pension Appeals Board with leave of the Board (section 85).

The Pension Appeals Board consisted of 8 members in 1977, 7 of whom were Supreme Court judges of various provinces and one county court judge (board duties are in addition to their regular judicial duties). The judges must be bilingual and undertake extensive travel throughout

Canada to conduct hearings.(27) Three judges constitute a quorum; this requirement adds to the difficulty of organizing hearings.

Between 1966 and 1976 there were a total of 714 appeals to the Minister of National Revenue with regard to CPP contributions, and 88 cases brought before the Pension Appeals Board.(28) With regard to CPP benefits there were 1,629 appeals to the Minister of Health and Welfare from 1970 to 1976 (9 months) and 282 cases brought before the Pension Appeals Board (1966-1976).(29) There are now about 200 appeals a year to the Review Committee.

The vast majority of appeals under section 83 deal with entitlement of the applicant to a disability pension, and a complex procedure has been established which includes medical examination at the expense of the CPP.

A study of the Pension Appeals Board for the Law Reform Commission of Canada (1979) stated that in social security, the guarantee of individual justice, the need for consistency and the importance of speed in rendering decisions appear as essential considerations in any serious reflection upon the reform of administrative procedure. The study found access to information to be unsatisfactory and saw an urgent need to revamp litigation to ensure less delay. With regard to CPP contributions, the entire appeal process takes about 2 years and 2 months; and with regard to CPP benefits, the process takes 2 years and 9 months.(30) The real causes of inefficiency were found to be in the administrative structure itself: the multiplicity of appeal authorities in each area of jurisdiction and their impermanent character. The study recommended abolition of the Review Committee and replacement of the board by a new federal social security tribunal with wide jurisiction in all social security matters, including CPP, unemployment insurance, and OAS. The tribunal would be 5 to 7 members composed of judges and others, and appeals could be heard by one member.

Problems with the Review Committee procedure in relation to competing claims for survivor benefits have been referred to in decisions of the Pension Appeals Board. Competing claimants may not meet at earlier appeal levels. The board itself has suggested that the Review Committee procedure be eliminated and a direct appeal to the board be allowed (see MNH&W v. Bogle et al., CCH Canadian Employment Benefits and Pension Guide Reports, p. 6448). In MNH&W v. Germano et al., (CCH, p. 6453) the board states, "...perhaps this should be an occasion to review the necessity of such a Committee at least where conflicting claims to a survivor's benefit are being aired. It results in a time and money-consuming effort which is of no apparent benefit."

The Commission has not done a detailed investigation of the CPP appeals procedure. We refer to these matters as appropriate for review when the CPP is next being amended.

NOTES

(1) Table prepared by Harry Weitz for his study of coverage, reproduced in full in Volume VIII. Readers wishing to use these statistics are referred to comments by Mr. Weitz on the lack of strict comparability between the two data bases used.

(2) Canada Pension Plan, R.S.C. 1970, c. C-5, as amended, section 6(2).

(3) Brief 182.

(4) See Volume III, Chapter 8, for a discussion of the position of women generally with regard to retirement income.

(5) This illustration sidesteps some of the technicalities revealed by a careful reading of the Act, sec. 48 and 49. One should keep in mind that:

a) contributory period as defined in sec. 49 excludes months during the child-raising period in any year when the person's earnings were equal to or less than the YBE.

b) the child-rearing dropout is applied to reduce the contributory period (as defined) - before any other dropout - and is equal to the total child-rearing period (sec. 43(1)) less any months already taken into account in arriving at the contributory period. In other words, months of low or no earnings in years when the person's earnings exceeded the YBE.

c) the over-65 dropout, if applicable, is a reduction of the remaining months. Low-earnings months are offset, but not those months already dropped under (b).

d) the 15 per cent dropout is applied to the remaining months (after applying the first two).

e) the 120-month minimum is overriding; no dropout can have the effect of reducing the divisor to less than than 120, referred to as basic contributory months. (There is one exception: the case of a disability pensioner - see sec. 43(1)).

(6) Brief 176.

(7) Ontario in effect has veto power over amendments to the CPP affecting benefits and contributions because such amendments require the approval of two-thirds of the participating provinces having two-thirds of the population of the participating provinces. Ontario has slightly over 50 per cent of the total population of participating provinces.

(8) Summarized from letter dated January 12, 1977 from the Hon. James Taylor, Q.C. Minister of Community and Social Services to the Hon. Marc Lalonde, Minister of National Health and Welfare.

(9) A more detailed description of surviving spouse provisions will be found in the outline of features in Chapter 2, and in Volume I, Chapter 5.

(10) See Volume I, Chapter 6.

(11) Revenue Canada, Taxation Statistics 1978 (for the 1976 taxation year). Table 3, p. 50 and Table 4, p. 58.

(12) See the Commission's analysis of Adequacy of Benefits from Government Programs, Volume I, Chapter 6.

(13) See Appendix C-4.

(14) Committee on Financing Benefits of the Quebec Pension Plan and Supplementary Pension Plans; Report, 1978.

(15) Recommendations R10 to R23.

(16) Younger if there are dependent children.

(17) "Dependent child" is one aged 18 years or under.

(18) See Volume I, Chapter 6, for full discussion and methodology.

(19) See also Canadian Labour Congress, Brief 304.

(20) "Available income" is defined as income after tax, plus the value of benefits universally available to those age 65 and over in Ontario such as tax credits. See Volume I, Chapter 6.

(21) See Tables A-1 to A-4 in the methodology for net replacement ratios in Volume I, Chapter 6.

(22) See remarks concerning the married person whose spouse is under 60 in Adequacy, Volume I, Chapter 6.

(23) For a full discussion of the issues involved in retirement age see Volume III, Chapter 15.

(24) See Report on Consumer Survey in Volume VIII.

(25) The U.S. social security benefit is reduced $1 for every $2 of excess income. Income could be earned up to $2,760 in 1976 without a reduction, and up to about $3,500 in 1979.

(26) To be lowered to age 70 after 1981.

(27) Pierre Issalys, The Pension Appeals Board, a study of administrative procedure in social security matters, prepared for the Law Reform Commission of Canada, 1979, p. 55.

(28) Ibid., pp. 94, 114.

(29) Ibid., pp. 94, 150.

(30) Ibid., p. 307.

LIST OF TABLES

Table 1 - Estimated Coverage in Ontario Under CPP and Private Pension Plans for Selected Years 1969-76 111

Table 2 - Social Security Expenditures as Percentage of Earnings Base, Canada and United States 132

Table 3 - Ratio of Population Age 65 and Over to Population Age 20-64, Canada and United States 133

Chapter 9

Conclusions and Recommendations

CONCLUSIONS

The financial security of the CPP has become a concern for the average working Canadian. In the Commission's opinion this concern is unfounded. The CPP is not bankrupt and will not be by the time the extra population from the post-war baby boom starts to receive retirement benefits, if benefit levels and the funding structure remain unchanged. This is so even with high inflation and a low birth rate. Contributions will have to be increased; but that eventuality has never been in dispute. The timing and extent of contribution adjustments, however, are matters of legitimate and vital concern.

The scheme of the CPP funding is unfolding as predicted in 1964. The latest statutory actuarial report for the plan and the Commission's projections show that in the year 1985 or 1986 benefits will exceed contributions for the first time. This does not mean that contributions need increase immediately when that event occurs. Rather it means that less money will then be available for borrowing by the participating provinces. Interest on the existing fund will continue, and for another five or six years will be available for additional provincial borrowing. For some ten years therefore, there will be no real need to increase contributions for the CPP itself.

That ten-year moratorium offers two major temptations. The first is to increase benefits without raising contributions to the full extent of benefit costs. This would have the effect of reducing the time within which the main decision on contribution increases must be made; but it might be politically attractive in the short run.

The second temptation is to increase contributions (and benefits to the extent necessary to justify politically the increase) beyond the

amounts required on a pay-go basis to supply additional capital for borrowing by the participating provinces at favourable rates. Such increases could be as large as that projected for a fully-funded CPP.

The Commission's recommendations would not only reject both these temptations but would convert the CPP to a design most compatible with a system of social security.

When CPP contributions are required to increase in about 1991, the Commission recommends that the new rates be sufficient to place the plan on a pay-as-you-go basis. The only fund required should be one limited to twice the year's benefit and administrative cost pay-out three years in advance. This would cover any unexpected fluctuations in benefit requirements. The rates should also be set with consideration of the long-run requirements of the plan, and should have a monitoring and adjusting mechanism which will facilitate any necessary changes and avoid disruption of other public and private programs.

The Commission's investment recommendations would replace the present system (which invites the description of "ghost funding") with marketable securities of provincial Crown corporations having tangible and creditable value. The discipline of regular capital markets would discourage unnecessary government borrowing and would also ensure a market rate of return for the plan and a definite schedule for repayment of government obligations.

Since the fund available for investment under the recommended pay-as-you-go design will be small compared with any full or partial funding design, there is no danger that CPP transactions will involve the government in swamping or controlling Canadian capital markets.

Alteration of existing benefit features should also be approached with caution and with full recognition of the cost implications of any changes. The Commission favours the adoption of a child-rearing dropout provision, while realizing it will have an additional cost, because it appears to have such universal support in perception of a social need. On the other hand the Commission does not accept the approach of Cofirentes+ for short-term survivor benefits because it does not believe such an approach reflects social perceptions today.

The problems of today's elderly, particularly women, are not created by inadequate CPP survivor benefits. Their problems have their roots in the economic and social structure of times before the CPP began, and cannot be cured by a sudden increase in these benefits for the near and long-term future. Short-run solutions for problems such as these would be disruptive for the CPP. Since rapid and direct action is required to alleviate the problems of the elderly, such action would be better taken through income-tested programs such as an expanded GIS. It would then be clear that it is today's work-force that is called upon to support today's elderly population.

The CPP vehicle is then left to move steadily towards the fulfilment of its dual role in the government's system of social security: first to provide, along with OAS and GIS, a minimum adequate income for those 65 and over; and second, to assist the worker in preserving into retirement his or her pre-retirement standard of living, by providing a measure of income replacement.

With regard to the latter role the Commission believes that the present CPP level of income replacement ought not to be expanded to the detriment of other vehicles which allow more individual choice and involve less threat of over-burdening future generations with their cost. The Commission's recommendations favour a provincial universal retirement savings plan as well as improvements to employment pensions. In particular the ten years before CPP contributions rise should be used by Ontario to build up the Provincial Universal Retirement System (PURS) by accommodating contributions by both employers and employees to that money-purchase plan. If CPP contributions were to increase dramatically in 1985 or 1986 there would be resistance to the adoption of any scheme requiring further contributions. Ten years of contributions to PURS before changes in the CPP rates would allow a smooth flow of new capital into the private markets. There would also be time for adjustment to a suitable retirement goal, incorporating income to be provided by the CPP, PURS, employment pensions and other retirement savings vehicles.

The 1980s should see the beginning of new approaches to retirement income planning. Ontario is now in a position to adopt measures that will ensure a sound Canada Pension Plan as part of an effective retirement income system.

RECOMMENDATIONS

The Commission therefore recommends that:

The Canada Pension Plan be funded on a pay-as-you-go basis, with a contingency fund maintained at the level required to satisfy twice the year's benefit and administrative cost pay-out three years in advance.

The existing combined contribution rate of 3.6 per cent continue unchanged until such time as the existing fund is reduced to the level required to satisfy twice the year's benefit and administrative cost pay-out three years in advance.

When an increase in contribution rates on a pay-as-you-go basis is required there be a gradual phasing-in of increases to approximate pay-as-you-go rates by setting contribution rates six years in advance

of such changes, to maintain a contingency fund at all times equal to twice the year's benefit and administrative cost pay-out three years in advance.

Until the existing fund is reduced to the level required by the recommendations, the CPP fund be operated on the Fund C basis outlined in Statutory Actuarial Report No. 6 for the CPP, with actual payment of interest on borrowing to be made after excess funds above the level required to satisfy twice the year's benefit and administrative cost pay-out three years in advance are no longer available for lending to the provinces.

The CPP fund be operated on the Fund C basis so that no repayment of capital of the fund is required from the provinces except on a call basis to satisfy the purposes of the contingency fund.

There be no increases to the benefit formula under the CPP without an increase in contribution rates on a pay-as-you-go basis with a contingency fund to satisy twice the year's benefit and administrative cost pay-out three years in advance, to cover the full cost of such increased benefits without regard to any excess funds on hand resulting from existing funding procedures.

The investment structure of the CPP be altered to ensure the receipt of market rates of interest on the capital of the fund and to ensure a control of investment through links with normal market practices, by adopting the following procedures:

a) upon maturity of existing provincial undertakings, commencing in 1986, each obligation be replaced with a twenty-year negotiable bond with a fixed maturity date issued by a provincial Crown corporation, guaranteed by the province and accompanied by a certificate of the treasurer of the province that the proceeds of such bonds are being used,

   (i) to invest in fixed assets of the provincial Crown corporation, or

   (ii) to refinance outstanding debt of the provincial Crown corporation originally used to finance acquisition of fixed assets;

b) the interest rate on such new securities be at the market rate determined by the average rate prevailing in the twenty preceding trading days on outstanding long-term debt issued by

or guaranteed by the province, denominated in Canadian dollars; or struck by reference to

(i) the average of interest rates on all outstanding debt issued or guaranteed by participating provinces, weighted according to CPP contributions in the year of calculation, or

(ii) the average interest rate on outstanding debt issued or guaranteed by the province concerned, with the treasurer of the province having the right to elect between (i) and (ii);

c) all funds declined by the provinces in any month be invested in 90-day treasury bills of the province concerned, or of the federal government if no provincial bills are available, until such time as the province takes up the funds against the securities of a provincial Crown corporation as stipulated in a).

The Government of Ontario support the continuation of the CPP on its present compulsory and "earnings-related" basis and resist any extension of coverage to unpaid workers.

The Government of Ontario approve the amendment of the CPP for the child-rearing dropout provision as now legislated, to take effect without delay.

Benefits payable to the survivor of a deceased contributor in receipt of retirement benefits continue to be approximately 60 per cent of the pension benefit of the deceased contributor, and that the Government of Ontario resist any extension of the existing survivor benefits.

The Government of Ontario take no steps to extend the principle of credit-splitting upon dissolution of marriage to create a division of credits during marriage.

Since the CPP is fulfilling the social role required of government by providing, with other government programs, nearly 100 per cent replacement income for those working below or at the Average Industrial Wage, that the Government of Ontario resist any steps to increase the existing levels of retirement benefits and survivor benefits under the CPP, or alter the existing goal of 25 per cent of the Average Industrial Wage for those at the YMPE, and that such benefits continue to be financed by equal contributions by employer and employee.

The earliest age of eligibility for CPP retirement benefits should continue to be age 65, with any future change to be only in concert with all government retirement income programs.

The Government of Ontario consider amendments to the CPP to provide a more effective, less complicated, and less time-consuming procedure for appeals as to both contributions and benefits under the CPP.

All CPP benefits continue to be based on earnings indexed to the Average Industrial Wage, and after payment commences, be indexed as at present to the Consumer Price Index.

No earnings test for retirement benefits be reinstated in the CPP while age for eligibility for retirement benefits remains at 65.

Resource Studies

Comparison of the Royal Commission's Population Projection Assumptions with those of Statistics Canada

Ann Jamieson

CONTENTS

List of Figures 146

Fertility 147

Migration 149

Mortality 150

Population Projections 152

Summary 158

Notes 159

LIST OF TABLES

Table 1 - Comparison of Assumptions for Fertility, Migration, and Mortality, for Population Projections Made By the Royal Commission and Statistics Canada 150

Table 2 - Projected Population of Canada, 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates 153

Table 3 - Projected Population of Canada, 65 and over, 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates 155
Table 4 - Projected Population of Ontario 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates 157

LIST OF FIGURES

Figure 1 - Total Fertility Rates Projected to 2001, According to Scenarios Prepared for the Royal Commission and Statistics Canada 148

Comparison of the Royal Commission's Population Projection Assumptions with those of Statistics Canada

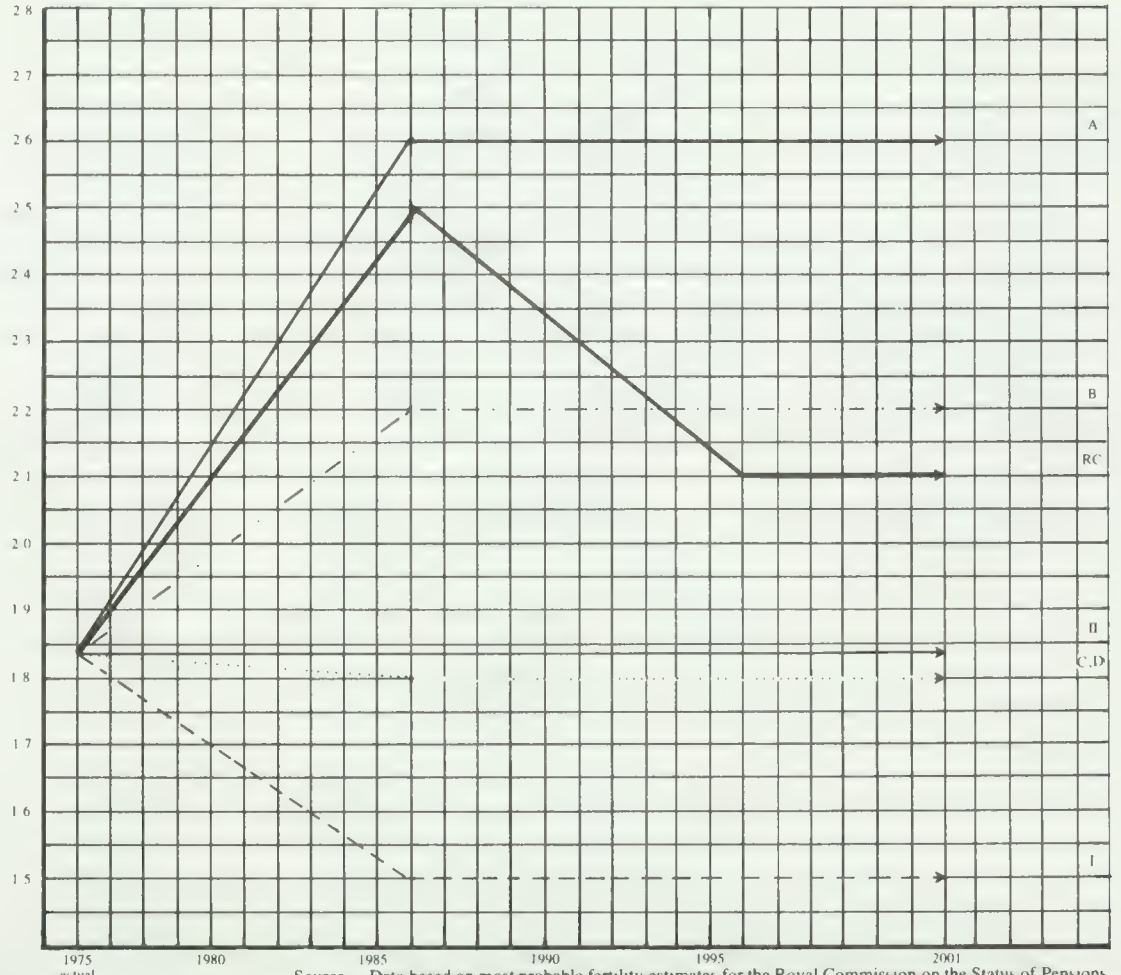
Because many readers will be familiar with population projections done by Statistics Canada(1) we outline the reasons which prompted the Commission to do its own demographic research and to compare the two sets of projections. Principally the Commission felt that the data available through Statistics Canada used too short a time basis for the Commission's purposes; even though the population figures used by Statistics Canada are projected to the year 2001, the fertility assumptions on which they are based remain constant after 1985, and mortality trends end in the 1985-89 period. Since the Commission must apply the results of its work to funding predictions for the Canada Pension Plan, population projections for the longer term are essential. Consequently the Commission chose to carry its assumptions for fertility forward to 1990, for immigration to the year 2000 and for mortality through to 2050. As has been mentioned, the Commission chose what it considered to be the most probable fertility scenario. In this section we compare this choice with the range of scenarios in Statistics Canada's work. These are labelled A, B, C and D in the Statistics Canada population projections. However, two other projections appear in a discussion of dependency ratios to be found in Social Security National Programs, 1978.(2) While fertility assumptions in that study go forward only to 1985 as before, the population figures are available for 2051 and allow for longer-term comparisons with the Commission's work. Since the Commission's projections were done on the basis of five-year intervals ending with "0" and "5", while Statistics Canada uses Census years, "1" and "6", absolute accuracy of comparison is not possible, but the difference is not enough to nullify any comparison of the overall direction of the projections.

FERTILITY

The Commission's projections (described in Chapter 3) are expressed in terms of Net Reproduction Rates(3) while Statistics Canada uses Total Fertility.(4) For purposes of comparison, therefore, the Commission's figures have been converted to Total Fertility: a Net Reproduction Rate of 1 equals 2.112 Total Fertility - that is 2.112 births per female provided she survives to the child-bearing years. A comparison of the various Total Fertility assumptions follows:

Commission: increase to 2.5 in 1985, drop to 2.3 in 1990, drop to 2.1 in 1995 and remain constant thereafter.

Figure 1 Total fertility rates projected to 2001, according to scenarios prepared for the Royal Commission and Statistics Canada



Source Data based on most probable fertility estimates for the Royal Commission on the Status of Pensions in Ontario; "Population Projections for Canada and the Provinces, 1972-2001," Statistics Canada, Catalogue 91-514, Table 6-1, page 59; "Social Security National Programs, 1978", Statistics Canada, Catalogue 86-201, Table B, page 7

Statistics Canada A
B
C, D
I
II
Royal Commission

Statistics Canada:

"A" - increase to 2.6 in 1985 remaining constant thereafter

"B" - increase to 2.2 in 1985 remaining constant thereafter

"C" - increase to 1.8 in 1985 remaining constant thereafter

"D" - increase to 1.8 in 1985 remaining constant thereafter

Projection I - dropping from the 1975 rate of 1.84 to 1.5 in 1985 and remaining constant thereafter

Projection II - remaining at 1.84

As can be seen from Figure 1, the Commission's assumption of a slight increase in the rate does not reach as high as the Statistics Canada "A" projection (high fertility), and drops to a level slightly below the "B" projection (medium fertility).

MIGRATION

a) International

The Commission assumed immigration of 100,000 per year and emigration of 40,000, with the resulting net figure of 60,000 being escalated by .5 per cent per year to the year 2000, at which time it reaches 66,960 and remains constant thereafter. It is assumed that Ontario will receive 50 per cent of the immigrants and lose 40 per cent of the emigrants.

Statistics Canada uses a range of figures for immigration, based on experience, from a high of 200,000 through 160,000 and 120,000 to a low of 80,000 per year. Their assumption of a constant emigration of 60,000 per year results in net figures of 140,000, 100,000, 60,000 and 20,000, and no escalation of these figures over time is assumed. For the projections only the two middle figures are used. The higher of these two (100,000) is used for Projections A, I and II, the lower (60,000) for Projections B, C and D. Statistics Canada assumes that Ontario receives a constant 53 per cent of the total immigration and loses 40 per cent of the total emigration from Canada.

b) Interprovincial

Ontario's traditional position as a net gainer from interprovincial migration is reflected in Statistics Canada's assumptions - the change to a net loser position in the mid-1970s was too recent to have been incorporated into their figures. Their assumptions break out as follows:

A - high migration, with Ontario gaining 36,218 per year;

B - medium - high migration, with Ontario gaining 25,435 per year;

C - medium - low migration, with Ontario gaining 12,712 per year (one-half of "B");

D - low migration with Ontario gaining 4,500 per year.

As mentioned, the Commission has assumed a net gain of ±0 for internal migration, based on the swing from gain to loss experienced in recent years.

MORTALITY

The Commission's assumptions, based on the 1971 Census population and U.S. Actuarial Study No. 77 are discussed in Chapter 3. For their projections Statistics Canada used the post-censal population estimates of June 1, 1972 and constructed abridged life tables for Canada.(5) Their broad underlying assumptions coincide with those accepted by the Commission:

- a continuing improvement in life expectancy for both sexes;

- a widening of the gap in life expectancy between the sexes;

- some improvement in infant mortality;

- some increase in violent deaths for males aged 20 and over;

- no allowance for a major medical breakthrough.

The assumptions used by Statistics Canada are common to all their scenarios.

A comparison of the several assumptions appears in the following table:

Table 1
Comparison of Assumptions for Fertility, Migration, and Mortality, for Population Projections Made By the Royal Commission and Statistics Canada

		Total fertility rate	Migration		
			International	Interprovincial	Mortality
Royal Commission		Rising to 2.5 in 1985, down to 2.3 in 1990, 2.1 in 1995 and constant thereafter	Immigration 100,000 per year, emigration 40,000 per year; the net 60,000 rising by .5 per cent per year to 2000. Ontario to have 50 per cent of immigration and 40 per cent of emigration.	Ontario ± 0	1971 Census population; 1970-72 Canada Life Table; U.S. Actuarial Report No. 77
Statistics Canada	A	Rising to 2.6 in 1985	Immigration 160,000, emigration 60,000, net 100,000 per year to 2000. Ontario to have 53 per cent of immigration and 40 per cent of emigration.	Ontario + 36,218 per year.	June 1, 1972 post-censal population figures; abridged life tables constructed.
	B	Rising to 2.2 in 1985	Immigration 120,000, emigration 60,000; net 60,000 per year to 2000. Ontario to have 53 per cent of immigration and 40 per cent of emigration.	Ontario ± 25,435 per year	See A
	C	Rising to 1.8 in 1985	See B	Ontario + 12,717 per year	See A
	D	Rising to 1.8 in 1985	See B	Ontario + 4,500 per year	See A
Projection	I	Dropping to 1.5 in 1985	100,000 per year to 2000. No stated assumption of Ontario's share.	No mention	No mention
	II	Remaining at 1.84 throughout	See I	No mention	No mention

Source Royal Commission on the Status of Pensions in Ontario.

The cumulative impact of differing demographic assumptions gives us a range of population figures which vary considerably at the years 2000-2001, and dramatically when projected to 2050.

Canada - Total Population

The Commission's assumptions of a slight resurgence in fertility and escalating immigration produce results that fall between the "A" and "B" projections of Statistics Canada. The comparisons set out in Table 2 show a high in 2000-1 of 34.6 million in "A" and a low of 28.2 million in Projection I. When extended to 2050, the low fertility assumptions of Projections I and II yield totals of 26.0 and 33.7 million respectively - well below the Commission's figure of 42.1 million.

Table 2
Projected Population of Canada, 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates

	Royal Commission	Statistics Canada "A"	Statistics Canada "B"	Statistics Canada "C"	Statistics Canada "D"	Projection I	Projection II
				(millions)			
1975	23,259						
1976		23,086.1	22,846.3	22,772.4	22,769.8	22,905.7	22,905.4
1980	24,872						
1981		25,311.5	24,472.5	24,041.4	24,036.2	24,299.9	24,408.1
1990	28,801						
1991		30,177.6	27,902.1	26,591.4	26,582.9	26,672.8	27,463.0
2000	31,596						
2001		34,611.4	30,655.5	38,369.7	28,360.0	28,250.7	29,757.5
2010	34,315						
2011		n/a	n/a	n/a	n/a	29,167.5	31,642.1
2020	36,980						
2021		n/a	n/a	n/a	n/a	29,387.4	33,020.5
2030	38,930						
2031		n/a	n/a	n/a	n/a	28,838.6	33,726.7
2040	40,621						
2041		n/a	n/a	n/a	n/a	27,595.1	33,856.8
2050	42,126						
2051		n/a	n/a	n/a	n/a	26,090.3	33,737.1

Source Royal Commission on the Status of Pensions in Ontario.

Since the population that will be 65 and over in 2000-1 has already been born, the factors of mortality and immigration are the only ones that will affect the totals. Consequently there is minimal divergence to be found between the various projections. As seen from Table 3, they range from a high of 3,393,200 for "A" down to 3,337,700 for "D." The Commission's figure of 3,384,000 is in the upper range. Projections extended to 2050 naturally show greater divergence: the Commission's figure of 7,458,000 compares with 6,241,000 for Projection II and 5,922,500 for Projection I. The projections produce very similar results over the short term.

Table 3
Projected Population of Canada, 65 and over, 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates

	Royal Commission	Statistics Canada "A"	Statistics Canada "B"	Statistics Canada "C"	Statistics Canada "D"	Projection I	Projection II
				(millions)			
1975	1,944						
1976		1,975.0	1,975.0	1,975.0	1,975.0	1,971.3	1,971.3
1980	2,237						
1981		2,282.9	2,272.3	2,272.3	2,271.6	2,264.8	2,264.8
1990	2,860						
1991		2,943.5	2,916.0	2,916.0	2,913.5	2,909.5	2,909.5
2000	3,384						
2001		3,393.2	3,341.8	3,341.8	3,337.7	3,358.1	3,358.1
2010	3,973						
2011		n/a	n/a	n/a	n/a	3,881.6	3,881.6
2020	5,358						
2021		n/a	n/a	n/a	n/a	5,180.0	5,180.0
2030	6,712						
2031		n/a	n/a	n/a	n/a	6,406.0	6,406.0
2040	6,771						
2041		n/a	n/a	n/a	n/a	6,236.5	6,229.7
2050	7,458						
2051		n/a	n/a	n/a	n/a	5,992.5	6,241.4

Source Royal Commission on the Status of Pensions in Ontario.

Ontario - Total Population

Figures are available for the short term only since Projections I and II deal only with the total Canadian population. From now to 2000-1 we find the Commission's estimates lying between Statistics Canada projections "B" and "C". The Commission's assumption of ±0 inter-provincial movement is the main factor in reducing the projected total. The figures range from a high of 14.6 million for Projection "A" to the low of 11.2 million for Projection "D". Figures for intervening years are shown in Table 4, as well as the Commission's projected totals to 2050.

Ontario - Population 65 and Over

The same condensed time-frame applies as in Ontario's total population projections; however, in these projections we note from Table 4 that the Commission's figure is slightly below any of the Statistics Canada Projections: 1.278 million for the Commission compared with 1.295 for Projection "D", in 2000-1. In any case, the Statistics Canada short-term figures are not helpful for an assessment of the CPP from Ontario's point of view since it is generally agreed that the crucial time is to be expected about 2030. As seen in Table 4, the Commission's projections show a rapid rise in the elderly population after about 2010.

Table 4
Projected Population of Ontario 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates

	Royal Commission		Statistics Canada "A"		Statistics Canada "B"		Statistics Canada "C"		Statistics Canada "D"	
	Total	65+	Total	65+	Total	65+	Total	65+	Total	65+
					(millions)					
1975	8,432	716								
1976			8,530.7	732.5	8,370.1	729.0	8,343.3	729.0	8,290.1	727.6
1980	9,072	820								
1981			9,672.1	848.9	9,187.7	840.2	9,027.9	840.2	8,904.0	836.7
1990	10,580	1,050								
1991			12,181.9	1,133.1	10,926.5	1,109.6	10,432.8	1,109.6	10,155.5	1,100.8
2000	11,727	1,278								
2001			14,698.0	1,361.1	12,518.1	1,315.8	11,628.7	1,315.8	11,183.2	1,295.3
2010	12,869	1,508								
2011			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2020	13,996	2,012								
2021			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2030	14,896	2,484								
2031			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2040	15,723	2,562								
2041			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2050	16,498	2,857								
2051			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source Royal Commission on the Status of Pensions in Ontario.

SUMMARY

The fact that the Commission's fertility and immigration assumptions produce population figures for Canada toward the upper end of the Statistics Canada range means that we expect a less drastic drop-off in the younger population than is currently predicted in some quarters, and because of the larger numbers of working age we expect dependency ratios in the next century to be a less serious problem than they are regarded in other current works. The size and structure of Canada's population is of crucial importance to the assessment of the Canada Pension Plan. Therefore, in the Commission's opinion, short-term projections such as those of Statistics Canada just discussed were not sufficient for such an assessment.

NOTES

(1) Statistics Canada, Population Projections for Canada and the Provinces, 1942-2001 (Cat. 91-514).

(2) Statistics Canada, Social Security National Program, 1978 (Cat. 86-201), Introduction.

(3) Net Reproduction Rate (NRR) - the probable number of female children each female will have during her lifetime.

(4) Total Fertility - the probable number of children a woman will have if she survives to child-bearing age.

(5) Population Projections, p. 21.

A Review and Critical Analysis of the Economic Literature on Social Security

Arthur Donner and Fred Lazar

CONTENTS

A Statistical Overview of the Financing of Capital Formation in Canada 163

A Comparison of the Implicit Contract under a Pay-As-You-Go Scheme and a Private Pension Fund 167

Saving, Investment, and Capital Formation: The Theoretical Interaction 168

Neoclassical Growth Models and the Appropriate Level of Savings 169

Savings and the Life-Cycle Hypothesis 177

The Mixed Empirical Finding on the Impact of Social Security Financing and National Savings 179

Gross Investment and Economic Growth: The Empirical Evidence 182

The Theory of Optimal Financing of Public Pension Plans 184

The Institutional Arrangements for Managing a Fully Funded CPP 188

Conclusion 190

Notes 192

List of Tables 196

A Review and Critical Analysis of the Economic Literature on Social Security

This study focuses on the issue of the optimal funding arrangement for old age assistance programs, such as the Canada and the Quebec Pension Plans (CPP and QPP). This subject is receiving considerable attention in the public and private sectors in both Canada and the United States at this time.

In Canada, many actuaries, economists, and public officials have warned that the CPP may not be financially viable in the 1980s and 1990s. The problem has come into focus because of demographic studies indicating that the average age of Canada's population will rise significantly between the late 1970s and the year 2000. The consensus is that this population aging will necessitate either substantial increases in the CPP contribution rates to maintain the current relative level of benefits or a sharp decline in that level. Otherwise, with the same contribution rates, the existing reserve fund will fall seriously into debt if the current level of benefits is maintained.(1)

Similar demographically related concerns about the funding of its social security system are evident in the United States. But, as well, Feldstein argues forcefully that public pension plans have a substantial negative impact on the rate of private savings. Indeed, his studies and one by Munnell indicate that the pay-as-you-go social insurance system has had a significant negative impact on the level of savings and that the U.S. social security system has led to a marked reduction in the nation's stock of physical capital and hence the productive capacity of the economy.(2)

Under pure pay-as-you-go financing, contributions to the plan are immediately distributed as benefits rather than accumulated in a fund. To the extent that contributors consider such benefits compulsory sav-

ings, they may tend to reduce their rate of personal saving. A private pension fund or a fully funded public pension plan must build up an adequate reserve fund and, in principal, need not have a negative "savings" effect.

While the CPP is not quite as close to a pure pay-as-you-go system as is the U.S. social security system, because of the small contingency reserve fund that is available to finance provincial government debt, the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs (TEIGA), expressed similar concerns about the structure, development, and funding of the CPP in a recent report presented to the Royal Commission on Pensions in Ontario.(3) The report suggested that the public pension system - represented by Old Age Security (OAS), the Guaranteed Income Supplement (GIS), and the CPP programs - has also depressed personal savings in Canada. Indeed, the report showed that between 1952 and 1975 public pensions in Canada lowered the rate of personal savings by 3.1 percentage points. In 1975 this was equivalent to a 22 per cent reduction in the rate of personal savings from disposable income. The study concluded that, in the absence of Canada's public pension system, the personal savings rate in 1975 would have been 13.9 per cent rather than the realized 10.8 per cent. Therefore, there was a $3.5 billion reduction in the level of savings because of the negative impact of public pensions.

Obviously, then, in view of its terms of reference, the Commission must develop a position on the applicability and usefulness of the literature that is critical of public pension schemes. The following four issues seem to be central to the economic arguments against pay-as-you-go financing of public pensions:

1. the impact of the CPP on the aggregate savings rate of the economy,

2. the relationship between capital accumulation and aggregate economic growth,

3. the economic criteria for a fully funded CPP compared with a pay-as-you-go plan, and

4. the allocation of investment funds under a regime of a fully funded CPP.

Critics suggest that pay-as-you-go financing has resulted in a decline in aggregate savings rates. Such schemes may indeed have reduced the flow of funds available for public investment compared with fully funded investment programs and thus may have lowered the economic potential. This report considers both the theoretical and empirical evidence, with the purpose of framing a position on whether there is a fundamental difference between the impact of a fully funded scheme and a pay-as-you-go system on the aggregate savings rate or, indeed, whether this issue

should be judged as being at all relevant for the Commission. Our study considers whether private pension schemes may not also produce the same savings effects as a public pension plan, particularly if public pension plans complement rather than fully supplement the private plans. The discussion highlights the importance of economic assumptions and their relation to the issue, for if the assumptions are unrealistic, what conclusions can be drawn?

From a social welfare perspective, the TEIGA study argued that the choice of how to finance a social security plan is clear; that is, it should be made on the basis of relative rates of return to savings that are available to the contributors. In simple terms, the funding system that earns the highest rate of return is the one that is desirable and socially optimal. But in order to earn the highest rate of return, it may be necessary to invest the available funds not in government bonds but in the equity sector of the private capital market. Once again, the appropriateness of the assumptions is considered, particularly in relation to the measurements of rates of return in a fully funded and a pay-as-you-go plan. The desirability of equity investment in funded schemes is examined as well.

Finally, if Canada's social security system were organized on a private, fully funded pension basis, it is clear that the concerns over whether social security financing depresses the level of national savings and, in turn, whether a lower level of savings results in a lower real economic growth would not be relevant. Indeed, only one out of the four central issues would remain - the proper rate of return for a fully invested public plan.

The following sections of this report deal with the appropriate funding arrangements for a national pension plan. On the basis of the brief statistical overview of the interplay between savings and investment flows in the Canadian economy, one can intuitively grasp that the statistical significance of the first two issues - the depressing effect of public pensions schemes on national savings and capital stock accumulation - may have been overstated.

A STATISTICAL OVERVIEW OF THE FINANCING OF CAPITAL FORMATION IN CANADA

The aggregate statistics presented here relate directly to the question whether the existence of a public pension system does, in fact, alter an individual's savings decision and in turn lead to a lower level of personal and aggregate savings. When the CPP began in 1966, the personal savings rate in Canada was about 6 per cent of personal disposable income.(4) The rate drifted slightly downward until the early 1970s when it began to climb, reaching over 10 per cent in 1974 (Table 1). Yet the ratio of aggregate savings or investment to GNP has remained relatively constant over the past twenty-five years. As well, the personal savings ratio has displayed a wider degree of variability than the aggregate

savings ratio over the same period, rising to a fifteen-year high in the mid-1970s.

Table 1
Selected Savings Ratios, 1962-77

	Personal savings rate(a)	Business investment rate(b)	Investment/ GNP rate(c)
		(Per cent)	
1962	5.0	98.5	16.3
1963	4.4	97.3	16.5
1964	4.4	90.0	18.3
1965	6.1	83.0	19.4
1966	6.2	74.2	20.2
1967	6.7	78.0	19.1
1968	5.2	86.5	17.6
1969	4.8	81.7	17.8
1970	5.2	75.3	17.3
1971	5.6	76.0	18.0
1972	7.7	79.1	18.1
1973	8.4	86.6	19.0
1974	10.2	86.0	19.6
1975	10.8	71.2	20.4
1976	10.8	71.2	19.9
1977	10.7	70.9	19.4

a Personal savings, excluding change in farm inventories, as a proportion of personal disposable income.

b Corporate and government business enterprise, undistributed profits, and capital cost allowances as a proportion of gross fixed capital formation.

c Business gross fixed capital formation as a proportion of GNP.

Source Statistics Canada, National Income and Expenditure Accounts, 1962-1976, Cat. 13-201 (December 1977), pp. 2-3, 6-7, 28-31; and idem., National Income and Expenditure Accounts, 1963-1977, Cat. 13-201 (November 1978), pp. 6-7.

Much of the variability in the personal savings rate appears to be related to inflationary trends. During periods when the aggregate rate of inflation has been quite low - say, less than 3 per cent - the personal savings rate has tended to be below the fifteen-year average. Over the past half-decade, when increases in the rate of inflation have been in the double-digit range, the personal savings rate has shifted upward quite dramatically, despite the greater income uncertainty (Table 2). During this period, the female labour force participation rate soared faster than expected, and this contributed as well to an increase in the personal savings rate. In addition, federal and provincial fiscal incentives to encourage housing purchases combined with a sharp rise in family formation rates in the 1970s to augment the savings rates. Thus at a rather superficial level, the statistics in Table 2 seem to suggest that

even if the CPP has had a negative impact on the personal savings rate in this country, other factors - inflation, demographic trends, fiscal incentives - have been as important and may even have offset any negative effects.

Table 2
Rate of Personal Savings and Inflation, 1962-77

	Personal savings rate(a)	Inflation rate(b)
	(Per cent)	
1962	5.0	
1963	4.4	1.5
1964	4.4	1.3
1965	6.1	2.0
1966	6.2	3.3
1967	6.7	3.4
1968	5.2	4.1
1969	4.8	3.8
1970	5.2	3.6
1971	5.6	2.4
1972	7.7	7.0
1973	8.4	7.3
1974	10.2	11.0
1975	10.8	10.6
1976	10.8	7.2
1977	10.7	7.4

a Personal savings, excluding change in farm inventories, as a proportion of personal disposable income.
b Annual rate of change in implicit price index for personal expenditure on consumer goods and services.

Source Statistics Canada, National Income and Expenditure Accounts, 1962-1976, Cat. 13-201 (December 1977), pp. 2-3, 6-7, 28-31; and Statistics Canada, National Income and Expenditure Accounts, 1963-1977, Cat. 13-201 (November 1978), pp. 6-7.

This raises the further important question whether an empirical study of the relationship between the personal savings rate and the funding arrangements of the CPP, including the other existing elements of old age assistance programs, can distinguish between the effects of the CPP funding and other factors that have changed significantly over the postwar period. The data in Table 3 reveal that personal savings contribute less than 30 per cent of the total supply of savings to the Canadian economy. The principal sources of savings for investment purposes have been corporate retained earnings and capital consumption al-

lowances, which have generated over 60 per cent of the funds required to finance the level of physical capital expenditures undertaken in Canada over the past ten years. Thus, even if public pension schemes had a negative impact on the personal savings rate, unless the effect were substantial - say a decrease in the personal savings rate of 40 per cent or more - the effect on the aggregate savings rate would have been small. Moreover, given the importance of foreign sources of savings, it is conceivable that any shortfall in personal savings might have been supplemented by an inflow of foreign savings.

Table 3
Distribution of Savings and Gross Fixed Capital Formation, by Selected Groups and Periods, 1964-76

	1964-66(b)	1969-71	1974-76
	(Per cent)		
Distribution of savings(a)			
Persons and unincorporated businesses	14.3	15.9	26.8
Incorporated businesses and government enterprises			
Undistributed profits	18.2	17.0	18.1
Capital consumption allowance(c)	26.8	29.5	23.2
Government			
Surplus (deficit)	13.4	15.9	4.9
Capital consumption allowance	5.5	6.4	5.7
Non-residents	6.5	0.0	9.2
Capital consumption allowance - persons and unincorporated businesses	15.2	15.3	12.2
Distribution of gross fixed capital formation			
Persons and unincorporated businesses	22.7	20.9	24.1
Government	18.4	17.8	15.4
Incorporated businesses and government enterprises	58.9	61.3	60.3

a Total savings exclude adjustment on grain transactions, capital assistance, inventory valuation adjustment, and residual error of estimate.
b Three-year average.
c Including miscellaneous valuation adjustment.

Source Statistics Canada, National Income and Expenditure Accounts, 1962-1976, Cat. 13-201 (December 1977), pp. 16-17.

A further issue that arises in this connection and is dealt with more comprehensively later is whether savings lead to investment or investment to savings. The available data cannot, of course, provide an easy answer to this question. As noted later, the answer lies partly in whether a short- or long-run time frame is being considered and whether

or not the economy is moving along a path of full employment of labour and physical capital resources.

In sum, the savings and investment statistics presented in this study suggest

- that there has not been a long-run reduction in the personal savings rate since the CPP/QPP began;

- that even if the CPP/QPP has marginally reduced Canada's personal savings rate, the impact on the aggregate savings rate has been insignificant; and

- that inflation, demographic changes, and fiscal incentives seem to have affected the personal savings rate more than the CPP/QPP.

With these empirical factors in the background, it is possible to examine the theoretical and empirical studies that link the funding arrangements of a public pension scheme, the savings rate, and the rate of physical capital formation. A major concern in this report - the aging of the population in the 1980s and 1990s - becomes basically a question of the explicit and implicit contractual arrangements under the two alternative financing arrangements for public pensions, full- investment funding, and pay-as-you-go financing.

A COMPARISON OF THE IMPLICIT CONTRACT UNDER A PAY-AS-YOU-GO SCHEME AND A PRIVATE PENSION FUND

A private firm must fund its employee pension plan, for this is the only way the employees are guaranteed that their pension earnings will be delivered in the future. A large enough reserve must be accumulated to finance the benefits for all those insured and to provide for an effective real rate of return to savings. The adequacy of the reserve fund is judged by its sensitivity to expected inflow and outflow of the funds. Sufficient funds must be collected from the contributing employees and employers, so that the discounted value of the benefit obligations to be paid in the future would be equal to the current value of the investment fund.

From the perspective of such private funding criteria, the CPP is already bankrupt, since the discounted value of future benefits to be paid out by the CPP are calculated to be far in excess of the CPP fund available today. But the CPP was never designed to be fully funded on the basis described above. A better description of its funding mechanism is that although it is close to a pay-as-you-go scheme, unlike a pure pay-as-you-go plan the CPP has a large contingency fund. But what guarantees a worker contributing to this scheme that his pension benefits will actually materialize?

The underlying rationale is that the worker who is currently in the labour force is indirectly paying for his future CPP retirement benefits by undertaking an implicit contractual agreement with the federal government. That is, he is in effect agreeing to finance payments for those who are already retired in exchange for a commitment that the government will impose taxes on future generations of workers to finance his own retirement pension. Under the framework of a pay-as-you-go plan, no reserves need be accumulated as long as these future commitments are kept. The basically unfunded operation of the current CPP system is defended on the basis of this implicit contract. It also follows that a pay-as-you-go system will provide a worker who contributes to a plan a real rate of return on his contributions that is roughly equivalent to the growth of the national economy. If the national economy advanced at an average real rate of 5 per cent annually, the real return to pension contributions would be 5 per cent a year under constant contribution rates. If the national economy stopped growing, with constant contribution rates there would be no real return to pensioners for their earlier contributions.

Some of the criticisms voiced about the financing of the CPP and its anticipated net drain of funds in the 1980s relate to an uneasy feeling that many Canadians have about its financial soundness. But the view that, by not being actuarially sound, the CPP is in fact bankrupt tends to negate the value of the implicit contract between the Canadian public and the nation's government. Obviously, some have less faith than others that the federal government will raise taxes in the future to finance retirement benefits. Other critics stress that under pay-as-you-go financing Canadians may be unaware that someone is paying for retirement benefits. In our view, the more important arguments against pay-as-you-go financing of the CPP relate to the potential depressing effect that method may have on national savings and the comparatively higher returns under alternative funding arrangements.

Saving, Investment, and Capital Formation: The Theoretical Interaction

A nation's stock of capital increases because of past savings and investment decisions; that is, a part of a nation's production of goods and services is allocated to investment that in principle will increase the capital stock and yield consumption opportunities in the future. A distinction must, however, be made between real and financial investments. A financial investment that occurs when one individual or institution purchases an earning asset involves the direction of funds towards a particular use so as to yield a financial rate of return. A real investment refers to the actual increase in the physical stock of capital goods over time. Real investments are measured in terms of expenditures on equipment, plant, and the residential housing stock, and it is through these investments that the physical capacity of output expands. A real investment has its financial investment counterpart, but an aggregation of total annual financial investment far exceeds the amount of

real investment, though financial investment plays a crucial role in the capital accumulation process.

Thus the decision to invest, to allocate part of the stream of a given output towards capital accumulation, represents a substitution of the present consumption option for a greater future consumption opportunity. Clearly, then, the decision to invest is inherently bound up with the savings decision, and the relationship between savings and investment decisions is integral to understanding macroeconomic developments, both in the short and long runs. The savings decision involves abstinence; that is, the choice of withholding some available income from the consumption stream. It is the investment decision that allocates this available pool of income to physical capital accumulation.

At any time, the physical stock of capital represents the accumulated inheritances of past real investments. These past investments required society to choose between spending opportunities then and spending possibilities in the future. However, if the economy has unemployed resources when choices are being made, the choices are easier. As long as there are unemployed resources, both present consumption and present investment can increase at the same time. Only when society's resources are fully employed must a choice be made between consumption today and investment or capital formation that will yield additional "potential" consumption opportunities in the future.

Alternatively, investment expenditures represent an important part of aggregate demand and, in the shorter run, a certain level of investment expenditures, depending upon the size of the labour force and the productivity of its workers, is required to maintain the economy at full employment. This aggregate demand role for investment may be viewed as a shorter-run role, clearly distinguished from the longer-run role of increasing the productive stock of capital goods.

In sum, the very process of increasing investment spending results in a rise in total aggregate spending (the aggregate demand role) and an increase in productive capacity (the aggregate supply role). Thus investment spending is much different than consumer spending, since the latter expenditures only affect supply decisions in an indirect fashion.

NEOCLASSICAL GROWTH MODELS AND THE APPROPRIATE LEVEL OF SAVINGS

As noted in the previous section, investment or capital accumulation serves two roles in the economy: 1/ investment, as an element of spending, affects the level of aggregate demand; and 2/ investment that results in additions to the capital stock affects the potential "supply" growth rate of the economy. Our concern in this section is its latter role: the role of savings and investment as they relate to the long-term real growth rate of the economy.

If one accepts the proposition that growth in demand is positively related to growth in investment and, in turn, growth of supply is related to the level of investment, one reaches the basic conclusion of the neoclassical growth models. These growth models postulate that when the growth of aggregate demand is equal to the growth of supply, the rate of growth of output and investment is approximately equal to the aggregate savings rate divided by the capital/output ratio.(5) Investment and capital stock growth rates are positively correlated with the savings rate, and in the short run they increase together. However, as the growth rate of the capital stock begins to exceed the growth rate of the labour force, the increase in the capital/labour ratio brings about decreasing returns to the additional capital stock, and eventually the increased capital/output ratio offsets the increase in the savings rate and returns the growth rate of the capital stock and investment back to the natural, long-run equilibrium growth rate.

The natural growth rate of the economy is determined by the sum of the growth rates of the labour force and productivity, and in the long run such growth is independent of the savings rate. Changes in savings propensities will only have a short-term effect on the growth rate, though over the longer term the capital/labour ratio and the level of output per capita will increase with higher savings rates. Consequently, even though changes in the savings rate cannot alter the long-term equilibrium growth rate of the economy in the neoclassical growth models, the savings rate can determine the per capita output levels for the system. Hence, in the growth model, an inadequate level of savings translates into a suboptimal level of output and consumption. This conclusion is at the heart of much of the debate on the depressing effect of pay-as-you-go social insurance schemes on national levels of savings. But while a higher savings rate increases the capital/labour ratio and output per capita over time, consumption during the short-term adjustment period is reduced. Thus a 100 per cent savings rate is not optimal; nor is a savings rate of zero.

Phelps has developed a "golden rule" of savings, arguing that if intertemporal and intergenerational utility comparisons are ignored a savings rate exists that will result in optimum per capita consumption over time.(6) This optimum savings rate and concomitant optimum capital/labour and capital/output ratios are reached when the profit rate (profit per unit of capital) equals the natural growth rate of the economy. When the profit rate exceeds the natural growth rate of the economy, the capital stock is suboptimal; when the profit rate is lower than the natural growth rate of the economy, the capital stock is superoptimal. Thus in Phelps's framework, the savings rate and the growth rates of investment and the capital stock are not optimal whenever the profit rate is not equal to the natural growth rate of the economy. Much of the debate on the optimal savings rate in a growth model can be traced back to this argument.

But Samuelson has argued that Phelps's golden rule and the golden path of capital accumulation are not necessarily optimal from the point of view of the current generation, which may have to forgo some consumption in order to increase the savings rate when the rate is suboptimal. (7) Thus it is necessary, in order to determine the most desirable level of savings from the point of view of the current generation, to compare future per capita income and consumption with their present levels. Samuelson concluded that if the divergence between the present and the golden rule savings rate is small and the planning horizon is quite long, then it is desirable to adopt policies that will in effect curtail consumption in the present period and increase the savings rate within a short period of time to the golden rule level. However, if the divergence between present and optimum savings rates is rather large and future incomes are discounted quite heavily, then the present optimum savings rate may be, and in fact is likely to be, lower than Phelps's golden rule value.

It appears, then, that the simple neoclassical growth model provides us with a criterion for determining whether or not the present savings rate is desirable in a timeless framework. But the necessity of making intertemporal utility comparisons leaves a policy-maker with no sound basis for determining whether or not the present savings rate is too low. The apparent "unambiguous" claim that the savings rate is at its optimum value when the profit rate equals the natural growth rate of the economy is, upon closer inspection, ambiguous when the consumption and saving preferences of the current generation are considered.

Even on the basis of the very strict assumptions in the neoclassical growth models, it cannot be argued that there is a single optimum savings rate that should be the target for policy-makers. When the assumptions implicit in the growth models are closely inspected, the irrelevance of the concept of the optimum savings rate becomes clear. Several of the more stringent assumptions that reduce further the applicability of these models as tools for policy-making are:

- While savings and investment decisions are made by a large number of possibly separate individuals, decisions are co-ordinated through the operation of the interest rate; in effect, the interest rate determines the investment rate.

- The economy is always operating at full employment.

- The economy is generally assumed to be closed; that is, there are no international flows of financial capital and no foreign trade.

- Finally, various types of capital can be aggregated into a single homogeneous measure and thus a single profit rate can be determined for the economy.

Let us consider each of these assumptions in turn.

It is obvious that the assumption about the interdependence of savings and investment tends to run counter to the basic Keynesian framework for an underemployed national economy. It also appears to be inconsistent with the importance of business-generated savings for the financing of investments. In the simple Keynesian framework, we encounter the famous paradox of thrift; that is, a higher level of savings will result in a lower level of consumption, and the lower level of aggregate demand will, in turn, lead to lower levels of investment and income. In equilibrium, in the simple Keynesian model, the higher savings rate will eventually lead to a lower volume of savings as well as to a lower volume of investment and income.

In contrast, in the neoclassical growth models, the higher the rate of interest the lower the level of investment and, conversely, the lower the rate of interest the higher the level of investment. In this framework, by increasing the flow of funds available for investment, a higher volume of savings will drive down the interest cost of the investments. This will in turn increase the desired capital stock and generate a higher flow of investment. By ignoring the "animal spirit of capitalists" and the importance of sales expectations in influencing the investment decision, the notion of the impact of a higher savings rate on the long-run capital stock in the neoclassical model is inconsistent with the Keynesian framework and the predominant reality.(8)

Indeed, it is more plausible to argue that a lower level of consumption resulting from a higher level of savings will adversely affect sales expectations on the part of the business community and over time lead to lower levels of capacity utilization, lower rates of return on capital, and lower levels of investment. It is also more reasonable to postulate that the rate of investment and the subsequent rate of growth of the economy will determine the level of savings, rather than the reverse. Marglin has advanced this view that the level of investment determines the rate of savings as the basis of his alternative theory of consumption and savings.(9)

The reversal of the cause and effect roles between savings and investment between the long-run neoclassical model and the short-run Keynesian framework becomes sharper when considered in the context of the full-employment assumption of the neoclassical models. It is conceivable that, if full employment were continuously being achieved, expectations for investment would then be favourable and the availability and cost of funds would dictate the actual level of investment. However, when the economy is not operating at full employment, the principal constraint on the level of investment is not the availability or the cost of funds but the attractiveness of new investment ventures. During periods of sluggish economic activity, low levels of capacity utilization, and high levels of uncertainty, the profit expectations associated with an investment venture are likely to contain a high-risk discount factor

that reduces the attractiveness of most investment opportunities. A modest change in the rate of interest is highly unlikely to compensate for the high discount factor in such periods. For example, if a firm assumes a risk discount factor of 10 per cent in attempting to calculate the present net worth of future profit flows associated with a particular investment project, an assumed decline of 1 percentage point in the prevailing rate of interest, say from 10 per cent to 9 per cent, amounts to only a 5 per cent decline in the overall discount factor - the rate of interest plus the risk premium. Obviously, the greater the risk premium the smaller the effect of changes in the rate of interest on present value calculations undertaken in evaluating and comparing investment opportunities. If a simple pay-off period rule were adopted by firms, changes in the rate of interest would have little bearing on the pay-off period. More likely the expectations and attitudes of the business community about their future sales levels and profitability would be much more important in determining the length of the pay-off period than would the rate of interest.

Since over the past twenty-five years in Canada the economy has operated within a full-employment zone for no more than three to four years, a less than full-employment assumption seems to be the more appropriate one to use when evaluating the relationship between investment and savings. In such situations not only are expectations more important in influencing the level of investment activity and hence the rate of growth of real GNP (and the resulting volume of savings), but at the same time there is no need to sacrifice consumption in order to free funds for investment spending. Resources can be put to work to produce both consumer goods and capital goods without forcing substitutions between production of different groups of commodities.

The relationship between investment and savings, as postulated by neoclassical economists, breaks down even further if we assume an open economy with a free flow of trade and financial capital between the Canadian economy and the rest of the world. The Canadian economy is clearly open, having no foreign exchange controls. And although the Foreign Investment Review Agency (FIRA) was set up to serve as a screening device and hence as a barrier to the inflow of capital, it has not proven to be much of a deterrent.

In the extreme case of perfect financial capital flows among countries, the domestic rate of interest in a country would exactly equal the international rate of interest, allowing for risk differentials, exchange rate differences, and expectations about future movements in exchange rates. Moreover, the domestic rate of interest would be determined, even accepting the remaining neoclassical assumptions, not by the flow of savings and investment within the country, but by the flows of savings and investment internationally. In such a case, a higher level of domestic savings would not necessarily lead to a higher level of domestic investment if the profit opportunities were more attractive elsewhere.

In a more plausible situation in which it is assumed that there are impediments to international financial capital flows, the aggregate level of investment in Canada would be more dependent upon domestic and international business expectations of sales, demands, and profitability in Canada. If, for some reason, Canada were to become a more attractive place than other countries in which to invest, then savings would flow into the country from abroad to make up any deficit in the level of finance that might occur domestically. Once again the level of investment would generate the savings flow necessary to finance the capital expenditures.

Turning our attention to another matter, we note that neoclassical growth models have focused primarily on physical capital accumulation and have ignored to a large extent investment in non-physical capital, such as human capital. The introduction of human capital into the analysis complicates growth models in at least two ways. First, the link between savings and investment becomes more direct on a personal level and cannot necessarily be monitored with statistics. A significant proportion of the savings undertaken by individuals is generally geared towards investments in themselves; that is, in the enhancement of human capital. Thus, the desired level of human capital accumulation to some extent determines the level of savings that will be undertaken by individuals.

The second complicating factor that arises when introducing human capital into the analysis is the index number problem. While growth models can be developed in one-commodity and two-commodity worlds so that the problems of aggregating the capital stock are minimized, the introduction of an alternative form of capital that is not directly comparable to physical capital makes it more difficult to aggregate the capital stock to come up with one distinct measure and one corresponding rate of return on capital. In other words, if the capital stock cannot be measured in terms of a single-commodity unit, then there is no sense to the statement that there is a distinct rate of return per unit of capital.

The introduction of human capital also raises the question whether the accumulation of physical capital adds more to achieving the desired output per capita value than does an increase in human capital. Let us assume that the physical capital and the adjusted labour supply are initially increasing at the natural growth rate. Then, as a result of some specific government action, the savings rate is increased. Would the effect of an additional sum spent on physical capital accumulation be greater or less on the achievable output per capita level than the effect of an equal sum spent on the rate of investment on human capital?

Standard neoclassical theory provides us with no insights into this particular question. However, studies concerned with the so-called residual explanation of economic growth, such as those by Denison and Wilson and Lithwick seem to provide some answers.(10) These studies, which attempt to account for the portion of the rate of real growth that

cannot be explained by increases in the quantities of the factor inputs, primarily labour and capital, have uncovered the fact that the unaccounted factor or residual of economic growth is quantitatively much more important than the rate of physical capital accumulation. Generally, while the rate of growth of the capital stock has accounted for between 15 and 40 per cent of the overall rate of growth of real GNP, the residual has generally accounted for 50 per cent or more of the overall rate of real growth.

Among the principal factors explaining the residual are improvements in the quality of the inputs, and particularly improvements in the quality of labour, as well as those in the organization of production. Superficially, such studies imply that enhanced human capital will contribute much more to Canadian economic growth during the short-term adjustment period than would an increase in the physical capital stock. But it is possible that a significant proportion of the so-called residual is embodied in the physical capital stock. If technological progress is included in the capital stock measure, a low rate of growth of physical investment will quickly lead to a lower rate of real growth and truly a smaller role for these residual factors. It is likely then that studies of the Denison type have underestimated the short- to medium-term impact of physical capital accumulation on the growth rate of the economy.

Finally, several ambiguities have crept into the analysis, especially in the measurement of the profit rate and the so-called social rate of return on capital. Robinson, a staunch critic of neoclassical economics, has persistently attacked the notion that a single measure of the capital stock can, in fact, be determined and that as a result there can be no such thing as a profit rate or rate of return on capital.(11) Without going into the complexities of her analysis, her main criticism is predicated upon the index number problem of aggregating heterogeneous commodities into a single measure. The critical question in this type of aggregation process is what weights should be used in the aggregation. Unfortunately, economic theory establishes no clearcut rules for determining the optimal weights to be used.

While Robinson's critique invalidates to a considerable extent the notion that there is a single rate of return on capital, this problem can be circumvented by measuring the capital stock and the rate of return in dollar terms. This procedure may not be theoretically correct, but it is widely used and serves as the basis for determining the rates of return that have been widely quoted and used in both theoretical and empirical discussions of the optimal financial arrangements for social insurance plans.

Feldstein has used such rates of return to support his contention that the levels of savings and capital accumulation in the United States are suboptimal. According to him, the private rate of return is in excess of the after-tax yield to savers and because of this wedge between

return to investment and return to savers there has been an inadequate level of savings. The inadequacy of savings that occurs as a result of this differential in rates of return and rates of interest is a result of government intervention in the capital market, and the U.S. social insurance system represents one component of this intervention. Consequently, instead of dispensing with the social insurance program, Feldstein argues that changes in the tax treatment of income from capital would appear to be more appropriate.(12)

However, there remains the question of the extent of the differential between the return on capital and the return to savers. The data used in constructing these rates of return were not calculated on the marginal investments undertaken in the economy but were averaged over a large number of firms.(13) Consequently, if the supposition is made that the marginal product of capital declines as the capital stock increases and that, in turn, the rate of return to capital in equilibrium is equal to the marginal productivity of capital, the average rate of return would likely be in excess of the marginal rate of return. Further, it is the marginal rate of return that is relevant for comparisons between the rate of return on investment and the rate of return to savers. If the marginal rate of return is truly below the average rate of return, the real gap - if it exists - must be smaller than that calculated by Feldstein. In addition, the private and social rates of return at the margin would be lower than estimated by Jenkins with Canadian statistics.

To summarize the main points raised in this section:

- This concept of an "optimum" savings rate is embedded in the neoclassical literature describing the long-term economic growth prospects for a very simple economy.

- The optimum savings rate is defined as the ratio of savings to output that would maximize consumption opportunities over time. In these models, a higher savings rate within limits leaves the long-run growth rate of the economy unchanged but results in higher levels of per capita consumption.

- These models imply or assume that savings lead to investment, not vice versa; the economy is fully employed; generations of people will never change their savings, investment, and consumption decisions; there is no international trade and no foreign capital flows; and the well-known law of "diminishing returns" applies to physical investment.

- The long-term neoclassical growth model and its notion of an optimum savings rate are interesting intellectual tools, but make little sense when compared with the realities of the Canadian economy. In Canada's case, underemployment rather than full employment has tended to predominate; consumption and investment

may be increased simultaneously; investment determines savings, rather than vice versa; and finally, Canada's economy produces both goods and services. At least 50 per cent of our GNP is produced by the service sector, while an additional 25 per cent is derived from foreign trade.

In our view, then, the neoclassical growth models cannot be applied to the reality of the Canadian economy. These simple models describe a mythical situation, and the concept of optimum savings derived from them provides little help to Canadian policy-makers facing an economy that is vastly more complicated. In the growth model world, a significantly higher savings rate would result in a higher future standard of living. In Canada's case, a higher savings rate would reduce consumption and lead to lower growth rates and higher unemployment.

SAVINGS AND THE LIFE-CYCLE HYPOTHESIS

Just as the empirical findings about social security financing and levels of national savings are ambiguous, the life-cycle hypothesis of individual saving and spending provides a rather tenuous foundation for empirical studies. The life-cycle model, which originated with Ando and Modigliani was, in fact, based upon a simple two-period model of saving and consumption expounded by Fisher.(14) In Fisher's model, individuals work during the first period of their lives and do not work during the second period. They are fully aware of the rate of interest that their savings will earn during the first period, and hence their decision on saving and spending involves determining the optimal amount of time they should work during the first period and the optimal level of savings they should accumulate to provide them with an income during the second or retirement period. In this simple framework, individuals save during their working years and dissave during their retirement years. Ando and Modigliani extended this simple two-period model to cover an arbitrary number of periods. In their model, the average individual is expected to dissave during early years in the labour force, save during the middle and later years in the labour force, and dissave during the retirement years. Thus saving is a means of smoothing out the stream of lifetime consumption.

Feldstein applied this life-cycle framework to postulate that a social security system has two offsetting effects on the level of savings during the pre-retirement period: "(1) it reduces personal saving because it substitutes for household assets, but (2) it also increases personal savings because it lengthens the period of retirement over which accumulated assets will be spread. The net effect of the pension depends on the relative strength of these two forces."(15) Since Feldstein, who is the most ardent supporter in the United States of the view that the social security system has significantly lowered the aggregate savings rate and in turn the level of capital formation, cannot arrive at an unambiguous conclusion about the relationship between the social

security funding and the savings decision, we are compelled to question whether the life-cycle model is a useful theoretical tool. If we accept the life-cycle model and apply it to an economy with a population growing at a constant rate with a constant age distribution, the implications for aggregate personal savings are that the sum of the savings by individuals will be exactly offset by the sum of the dissavings of those who have retired. That is, if we rule out a desire by individuals to leave an estate, then each individual's lifetime savings will be equal to zero, and hence there will be no aggregate savings.

But this conclusion obviously does not hold if there is an incentive on the part of individuals to save in order to leave an inheritance for future generations. This is important, for if the major impact of a public social security plan is to reduce the level of savings during the pre-retirement years, then one can rightly argue that the total effect will be to leave the zero net lifetime level of savings unchanged, since the level of dissaving during retirement years will be reduced. Even if we have a situation in which estates are to be left and personal savings are in aggregate positive, the effects of a fully mature social security system will be to leave the positive level of savings unchanged. This conclusion holds for mature social security systems whether the plan is pay-as-you-go or fully funded. Hence from a theoretical point of view, and based on the life-cycle model, for a social security system to have an adverse impact on the aggregate personal savings rate, there must be either a change in the age distribution of the population and/or personal differences in desires to leave estates for future generations.

A second question that arises in conjunction with the use of the life-cycle model is whether or not it is superior to what Marglin has labelled myopic decision rules that have nothing to do with lifetime optimization.(16) In effect, is the life-cycle model, or its cousin the permanent income hypothesis, superior to the simple Keynesian consumption function theory or the more sophisticated relative income hypothesis postulated by Duesenberry?(17) Unfortunately, this issue cannot be resolved empirically, as the evidence does not overwhelmingly support the life-cycle or permanent income hypothesis or the relative income hypothesis. If the latter theory is indeed more relevant for describing the savings-consumption decision by individuals, then there is no basis for arguing that a social security system can, in fact, alter the savings decision and have a possible negative impact on the aggregate savings rate. This is a fairly important point to keep in mind, for the empirical findings of Feldstein and Munnell are only valid if one accepts the underlying life-cycle model.(18) If one rejects that model and accepts in turn the supposedly less rigorous relative income hypothesis, then there is no theoretical basis for including some measure of public pension wealth in explanations of national consumption.

Marglin, in criticizing the life-cycle hypothesis, correctly pointed out that "it is too general to be contradicted by any conceivable empirical evidence, and therefore too general to be confirmed."(19)

Moreover, he argued, "in an uncertain world, 'lifetime' resources must necessarily be a subjective, unmeasurable magnitude subject to continued revision by decision makers, whose consistency over time with the axioms of revealed preference is in principle unverifiable." In other words, given the high degree of uncertainty associated with future incomes as well as future rates of return, individuals who adopt a life-cycle attitude towards savings and consumption must, of necessity, apply a high discount rate to future incomes in order to allow for the considerable risk associated with the future. Therefore, current consumption is, to a large extent, dependent upon current income and expectations of incomes one or two periods into the future. Consequently, as Marglin has emphasized, "the lessons of the life-cycle and permanent income hypothesis at most that current consumption is not determined by current income alone, the hypothesis which (as Friedman points out) no one would maintain in its pure form unless he expected to find orgies of consumption on pay days and abstinence at all other times."(20)

Thus, in light of the theoretical inadequacies of the life-cycle hypothesis, one must be sceptical of the results produced from the econometric analyses using this hypothesis as a basis for estimating the impact of public pensions on national savings and consumption.

THE MIXED EMPIRICAL FINDING ON THE IMPACT OF SOCIAL SECURITY FINANCING AND NATIONAL SAVINGS

Just as neoclassical growth theory, when examined carefully, is inconclusive on what should be the appropriate level for the national savings rate, there is no clear consensus about the impact of public pensions on aggregate savings.

The studies of Katona and Cagan concluded that persons covered by private pension schemes saved more than individuals who were not covered by such pensions. Neither Katona nor Cagan used the life-cycle hypothesis as a basis for specifying their structural relationships. Cagan analyzed the 1958-59 savings behaviour of more than 15,000 Consumer Reports subscribers and attributed the results to a recognition effect: participation in the pension plan calls attention to retirement needs and leads individuals to increase provisions for retirement.(21) Katona gathered survey data from personal interviews with approximately 2,000 families in 1962 and 1963 and, like Cagan, found that pension plans increased personal savings.(22) Katona's explanation of this phenomenon was that pension plans make retirement goals feasible and that workers both raise their retirement income goals and intensify their savings efforts. Thus both of these studies suggested that individual preferences for future versus present income is changed by participation in a pension plan as workers choose to reduce consumption or correspondingly increase savings during their working years in order to finance increased consumption during retirement.

Feldstein used the life-cycle framework for his study on the statistical relation between aggregate consumption and income, corporate retained earnings, non-social security wealth, and a constructed social security wealth variable in the United States for the 1929-71 period, excluding the war years. In this study, Feldstein concluded that social security wealth reduced the level of personal savings in 1971 by about 50 per cent. He estimated that this reduction in the savings rate reduced the U.S. capital stock by between 40 and 60 per cent in 1971 and this, in turn, resulted in a reduction in GNP of between 11 and 15 per cent.(23)

Munnell, using longitudinal data collected by the U.S. Department of Labor over a five-year period from 1966 to 1971, tested the life-cycle hypothesis for a sub-sample of employed male heads of households who were between 45 and 59 years of age in 1966. Without going into the details of her various tests, Munnell concluded that her results support Feldstein's contention and "directly contradict the findings of earlier studies by Cagan and Katona that persons covered by private pensions saved more than those not covered. This study, however, differs from earlier ones in important respects which may explain why previous efforts have failed to pick up the effect found here. We have focused solely on the saving behavior of the heads of households in the pre-retirement years. For these people, providing for retirement is the primary saving motive, and, therefore, these should be the people whose savings behavior is most sensitive to pension coverage."(24)

Barro has further complicated the issue by presenting empirical evidence that the social security system in the United States may not affect the level of personal savings at all. According to him, the intergenerational transfer through the social security system may be offset by voluntary transfers as the aged leave larger bequests or receive less support from their children.(25)

In Canada, the empirical findings have been just as ambiguous. In an attempt to replicate Feldstein's findings in a Canadian setting, Ilkiw modified Feldstein's structural relationship and observed that from 1952 - the year the universal Old Age Security program was introduced - to 1975, the personal savings rate in Canada fell a total of 3.1 percentage points, or 22 per cent. This reduction in personal savings translated into an 8.1 per cent reduction in the level of Canada's capital stock, according to Ilkiw.(26) But his analysis neglected the fact that, whereas the social security plan in the United States is a pay-as-you-go scheme, the Canada Pension Plan is a partially funded system. On the other hand, Pesando and Rea, though they did not undertake a detailed empirical study of the question, concluded that "for Canada, there is no evidence at the aggregate level that the introduction of the CPP and QPP has reduced private saving."(27)

In light of these mixed findings, what conclusions can be reached? From an empirical point of view, it is unlikely that the issue will be

resolved adequately one way or the other, since there is no comprehensive theoretical base for completely specifying the structural form of the relationship to be estimated. In addition, one encounters in such studies a serious problem of parallel movement between the two important savings determinants - income and wealth. As a result, it is difficult to have much confidence in the estimated value of the coefficients. Moreover, it is interesting that, while Feldstein estimated the dollar effect of social security wealth on the aggregate savings in the United States, he did not duplicate this exercise for non-social security wealth. One could also argue that non-social security wealth has resulted in a decrease in the aggregate level of savings and hence a reduction in the level of the capital stock in the United States. That is, in the context of the life cycle, a dollar of wealth, whether it stems from a social security plan or private savings, should have the identical impact on the level of consumption and savings.(28)

There are other serious problems with the Feldstein form of analysis that may further invalidate such findings. The size and statistical reliability of the regression coefficients in the estimating equations are sensitive both to the equation specification in the model and the time period of estimation. Moreover, the social security wealth variable, the crux of the measurement issue, may well be a proxy for other factors that have changed during the period since the introduction of social security. In addition, differences in the composition of the samples make comparison among studies extremely difficult. The findings of Munnell, Cagan, and Katona may have all been valid for the particular group that they tested, but this does not mean they apply universally to all groups.

Professor William R. Waters, in a paper presented to the Canadian Pension Conference, warned of these mixed empirical results:

"Sophisticated statistical tests [in the United States] have both confirmed and rejected the hypothesis that individuals have substituted this retirement income for other forms of wealth accumulation. To its credit, the Ontario Government has undertaken similar tests using Canadian data. However, the dramatic changes in our economy over the period for which data exist, and the brave assumptions necessary for statistical analysis of this sort, suggest that policy decisions in this area need to be based on something other than the results of such analyses." (29)

We tend to agree with his interpretation. There is so much ambiguity in the empirical studies undertaken in both countries, and so little general confidence in the "theoretical" and "practical" usefulness of these empirical results, that the issue should at best be bypassed as a means for evaluating the appropriateness of the pay-as-you-go financing approach of the QPP/CPP and OAS plans. Thus we suggest that it is necessary to look elsewhere for clues to determine whether a pay-as-you-go

or a fully funded social insurance system is preferable and to decide what is an adequate level of savings.

GROSS INVESTMENT AND ECONOMIC GROWTH: THE EMPIRICAL EVIDENCE

Let us consider the question whether Canada is in fact investing too small a proportion of its gross national product. Statistics gathered by Lesnoy and Hambor provide some support for the argument that a higher level of investment relative to GNP leads to a higher level of real growth. The authors note that between 1950 and 1962 there was a correlation of .58 between the investment/GNP ratio and the rate of growth of productivity for a sample of seven industrial countries. The positive correlation declined to .36 when the comparison was expanded to include eleven industrial countries. If, however, the observations for Japan and the United States are excluded, the positive correlation disappears entirely and, in fact, becomes marginally negative. This suggests that there are possibly some spurious factors accounting for the high level of productivity growth in Japan and the relatively low level of productivity growth in the United States that are totally unrelated to the rate of capital accumulation in these two countries.(30)

The data in Table 4 provide further evidence that the rate of capital accumulation in Canada may not be out of line with performance in other countries, including Japan. In 1960 Canada's comparative investment/GNP ratio ranked near the bottom among the nine nations, but even then it was only marginally below the ratios recorded by most countries other than Japan. But, in fact, is it total investment that contributes to productive growth or is it only private sector investment in non-residential construction and machinery and equipment? While investment in residential construction may assist in achieving certain social objectives, it is unclear whether such investments contribute to longer-term productivity improvements. Moreover, while public sector investment may be important in establishing the social and economic infrastructure within which private investment can profit, such investment may not materially increase productivity growth rates.

In reviewing the 1973 and 1977 investment/GNP ratios, it appears that part of the rather high rate of investment spending in Japan is accounted for primarily by public investment and investment in residential construction. In both years, Canada's non-residential investment/GNP ratio was among the highest. In fact, the real issue is very clouded, and there is considerable doubt about the conventional proposition that the relative level of investment in Canada is too low.

On the other hand, projections that have been made of capital expenditure requirements for the next ten- or fifteen-year period suggest that the investment/GNP ratio in Canada will have to increase between 2 and 4 percentage points in order to meet demand. In effect, such studies imply that Canada has its own version of a so-called capital shortage

Table 4
Investment/GNP Ratios, Selected OECD Countries, 1960, 1973, and 1977

	1960	1973			1977		
	Total investment/ GNP	Total investment/ GNP	Private investment/ GNP	Private non-housing investment/GNP	Total investment/ GNP	Private investment/ GNP	Private non-housing investment/GNP
Canada	22.9	22.5	19.1	13.1	23.1	19.7	13.7
Australia	28.6	23.2	19.5	14.3	23.1	19.0	14.4
France	24.0	27.7	24.3	16.3	-	-	-
Italy	24.9(a)	20.8			19.8	-	-
Japan	33.7	36.6	27.5	19.1	28.9	19.8	12.8
Sweden	24.7	21.6	16.1	11.0	22.0	16.5	12.2
United Kingdom	18.6	19.6	14.5	10.8	18.0	14.6	11.3
United States	18.3	-	15.5	10.4	-	15.0	10.1
West Germany	27.3	24.6	14.1	-	20.9	-	-

a 1963 value.

Source International Monetary Fund, International Financial Statistics (May 1978); Organization for Economic Co-operation and Development, Quarterly National Accounts Bulletin, (1978) III; and idem., National Accounts of OECD Countries (Paris, 1974).

that has been predicted for the U.S. economy. But Eisner has dismissed the notion that a future capital gap will emerge in the U.S. economy, as has Feldstein who points out that

> "there is an important sense in which any such forecast of a 'capital gap' is misleading. It appears to predict that the demand for capital will continually exceed its supply. Usually, when there is excess demand for some good, its price rises until demand and supply are equal. In the capital market, the interest rate and the cost of equity capital should increase until they are high enough to force firms to tailor their aggregate investment demands to the available supply. There will be no 'shortfall' of investment funds because the demand for funds will shrink to the available supply." (31)

While Feldstein resorts once more to the savings-leads-to-investment argument, we can reverse it and suggest that if there is to be strong demand for investment in Canada, these requirements will, in turn, generate the economic conditions that will bring about the flow of savings necessary to finance the investments. For the present time, however, it is not excess demand for investment that poses the problem but rather an undersupply of investment opportunities. Thus investment incentives would appear to be more appropriate than additional savings incentives for increasing Canada's capital stock. At some future time, if conditions turn around dramatically, then governments could provide additional tax incentives to increase the flow of corporate savings. Indeed, the RRSP is already a well-entrenched instrument in the financial structure that could be used as a means for stimulating further extra private sector savings.

THE THEORY OF OPTIMAL FINANCING OF PUBLIC PENSION PLANS

In its paper presented to the Commission, TEIGA argued that the choice between alternative ways of funding a national pension scheme should be made on the basis of rates of return. In some ways this is an attractive proposition for, as we have argued, the empirical work and the underlying theory provide no conclusive basis for discriminating between pay-as-you-go or full-funding arrangements. According to the TEIGA paper, such comparisons clearly favour full investment funding of the CPP/QPP plan.(32)

The crux of the debate on relative returns to savings requires a comparison of the "social rate of return" earned with full funding with the return generated by a pay-as-you-go system. The social rate of return is defined as the private rate on physical capital plus the amount of taxes normally levied on such capital; that is, the social rate of return is essentially the private rate of return plus additional private sector tax payments.(33) The rate of return to pension contributions available on the pay-as-you-go basis is roughly equal to the real growth

rate of the economy or the rate of growth of the labour force plus the improvements in labour productivity. The TEIGA paper utilized a 10 per cent figure as an approximation for the real social rate of return on capital to compare with a 5 per cent trend growth rate in real GNP. On this basis, the choice seems clear. That is, the ideal pension plan would be one that would be fully funded since it would yield a higher rate of return than a pay-as-you-go system.(34)

Thus the fairly standard conclusion, based on such comparisons, appears to favour the social rate of return argument. Pesando and Rea, for example, point out that "at an abstract level, one can demonstrate that the choice between pay-as-you-go and fully funded pension systems depends on the relationship between the social rate of return on capital and the rate of growth of earnings. Since empirical evidence suggests that the former exceeds the latter, an investment fund is desirable for Canada."(35) Moreover, if the pay-as-you-go scheme tends to depress national savings, as claimed by Feldstein and TEIGA, then by fully funding the CPP the resulting rise in the rate of savings would also lead to higher real incomes in the future. Full investment funding is consistent with a higher savings/income ratio, and the higher savings rate moves the economy to a higher per capita consumption plateau.

It is clear, then, that it is crucially important to assess properly the rates of return available under the alternative schemes. The TEIGA paper compared the 10 per cent social rate to a real annual earnings growth rate of 5.7 per cent from 1955 to 1974. Jenkins, in a paper prepared for the Economic Council of Canada, concluded that the social rate of return to capital in Canada is about 10 per cent and the real private after-tax rate of return was estimated to be 6 1/2 per cent. While one could easily quarrel with the host of refinements and adjustments for inflation he made to arrive at his real social return estimates, we will not do so here. Rather, we take exception to the sharp distinction drawn between the social and private rates of return.

For the social rate of return to, in fact, be different and at the same time greater than the private rate of return, it is necessary to assume that corporations bear the corporate tax burden; that is, the possibility that corporate income taxes and related taxes imposed upon business operations are not passed on in the form of lower wages, lower dividends, or higher prices. If corporate and other related taxes are indeed fully passed on to society, the abolition of corporate taxes would not decrease the total returns from capital. The abolition of the corporate tax would be accompanied by increased real income levels, but these would be offset by the higher personal income taxes necessary to make up the deficit in tax revenues for the various levels of government. More realistically, however, if corporate taxes were eliminated, the real private rate of return on capital would likely rise above its present after-tax level but not to the level of the presumed social rate of return, since many of the benefits of a zero corporate tax rate would be passed on to individuals. Thus we argue that it is inappropriate to

make as sharp a distinction between the social rate and private rate of return as is done by TEIGA and others.(36) Further, the important comparison is between the real rate of return on financial investments, rather than physical investment, and the rate of return on a pay-as-you-go system.

Comparisons between the rate of return on capital and the national growth rate of the economy as well as distinctions between the social rate of return and the private rate of return are, however, important when it comes to considering the optimal funding arrangements for a public pension scheme from another perspective. For example, the rate of return on a fully funded social insurance system is simply the weighted average of the returns earned from investing the funds in a host of financial securities. On the other hand, the rate of return on a pay-as-you-go system can be approximated, under certain circumstances, by the rate of growth of employment and productivity, in effect the natural growth rate of the economy. Approximating the rate of return on the pay-as-you-go system by the natural growth rate of the economy not only indexes the pension benefits to the rate of inflation, but to gains in real wage levels as well. The approximation is only valid, however, when there is either a constant age distribution for the population or when the rate of growth of employment equals the rate of growth for the pension population.

As the following relationship demonstrates, the average benefit for a pensioner (B) is equal to the average contribution rate (C) times total labour income, which in turn is a product of the number of employees (E) times the average wage and salary (W) divided by the number of pensioners (P). From this relationship, we can calculate that the annual growth in the benefits per pensioner will be equal to the sum of the annual growth rates in the contribution rate, employment, and average salaries less the growth rate in the pension population group:

$$(1) \qquad B = \frac{C \times W \times E}{P}, \text{ and}$$

$$(2) \qquad \% B = \% C + \% W + \% E - \% P.$$

In the calculation made by TEIGA, the rate of return on the pay-as-you-go contributions was approximated simply by the natural growth rate of the economy; the differences in the growth rates between the aggregate level of employment and the pension population were ignored. For this reason, the aging of the population was predicted to create problems for a pay-as-you-go funding arrangement. However, as can be seen from the above equations, the aging of the population would simply result in a decline in the rate of return on a pay-as-you-go system. Thus, if policy-makers decided to keep the rate of return equal to the natural growth rate of the economy, this would necessitate increasing the contribution rate.

Finally, let us consider rates of return available on financial investments. Given the rates of return on pay-as-you-go and fully funded systems, the optimal funding arrangement from the point of view of current contributors is the one that yields the highest return. At present, the funds contributed to the Canada Pension Plan have been invested primarily in non-marketable provincial government bonds. An examination of the data in Table 5 reveals that the real rate of interest earned on the securities in the past have been negative over the short periods and somewhat positive over longer periods.

In Tables 5 and 6, we set out some real rate of return estimates on bonds and equities in both Canada and the United States over the past fifty years. These types of estimates are widely used by the investment communities in both countries and are employed as reasonable pre-tax estimates for various financial investment instruments. We suggest comparing these types of rates with the long-term average growth rate of the Canadian economy as a means of selecting the optimal funding process for a public pension scheme.

Table 5
Rates of Return on Capital, Canada, 1927-76

	50 years	25 years	10 years	5 years
		(Per cent)		
Nominal returns				
Common stocks	7.71	8.12	5.44	4.98
Long-term government bonds	3.6	3.0	4.0	3.9
Consumer price index	2.47	3.31	5.96	8.29
Real returns				
Common stocks	5.24	4.81	-0.52	-3.31
Long-term government bonds	1.13	-0.31	-1.96	-4.39

Source "Report of the Committee on Economic Statistics, 1924-1976," October 17, 1977.

Table 6
Real Rates of Return on Capital, United States, 1927-1976

	50 years	25 years	10 years	5 years
		(Per cent)		
Common stocks	6.59	6.81	0.66	-2.29
Long-term government bonds	0.81	-1.84	-1.53	0.37
Long-term corporate bonds	1.52	0.45	-0.50	0.18
U.S. treasury bills	0.00	0.59	-0.21	-1.22

Note Actual changes are calculated using index values. Thus the ten-year change ending in 1976 uses 1966 as a base year.

Source Derived from statistics in R.A. Singufield and Robert G. Ibbotson, Stocks, Bonds, Bills, and Inflation: The Past (1926-1976) and the Future (1977-2000) (The Financial Analysts Research Foundation, 1977).

In any case, the real returns to government bonds have been below the real growth rate of the economy, although on a fifty-year basis the returns to equities have exceeded 5 per cent annually. On this simplistic basis, these figures provide a strong signal that pay-as-you-go financing is preferable to a fully funded government bond plan and a weak signal that full-investment funding in equities is preferable to the pay-as-you-go basis. The latter point requires emphasis. In order for the real rate of return to exceed the 5 per cent long-term growth rate of the economy, it would require that the fifty-year common stock average return be earned. Thus equity investment would be a must for long- term real values to materialize. In turn, heavy public investments in equities can result in other arrangements that can be less than satisfactory.

THE INSTITUTIONAL ARRANGEMENTS FOR MANAGING A FULLY FUNDED CPP

We noted in the previous section that for a fully funded CPP to be preferable to a pay-as-you-go system, investment in equities is necessary. This, in turn, raises a whole series of questions. For example, how would the fund be administered and managed? What would be the implications of a government-managed pension fund controlling large blocks of equity capital in the Canadian economy? Would investment in equities by a government pension group lead to conflicts of interest between government and certain companies or industries?

Despite the manifold management problems inherent in a system in which an enlarged CPP would invest in equities, it would in principle be possible to avoid or minimize some of the problems. As an example, instead of having one monolithic agency administering the investment of a large pool of funds, it may be preferable to hire a large number of private investment groups to administer separate small segments of the entire investment pool. Another version of this plan could perhaps involve the sale of rights to manage various blocks of the investment pool to private managers. As an example of the latter alternative, one could visualize Ottawa requesting tenders from private pension funds or investment houses, with the bidding occurring on the basis of paying a rate of return for a fixed block of money accumulated in the pension plan. The highest bids that exhausted the entire pool would be accepted. With a little ingenuity, many other possible schemes for decentralizing the investment decision could be devised.

But there still remain many other problems associated with adopting the fully funded system. The assumptions built into the plan about the real rate of return and wage growth are extremely crucial in determining the contribution rates and guaranteeing actuarial soundness. We can easily illustrate forecasting errors by pointing to the rather large deficit predicted for the CPP by about 1990. Earlier forecasts that proved too optimistic on rates of return on the investment pool as well as too low on estimated real wage increases are largely responsible for

today's actuarial concerns about the CPP. Obviously, this prospective deficit could be offset if contribution rates were increased or if benefits were reduced.

But such problems are not unique to public plans. One can also point to similar difficulties in many private sector schemes in Canada and the United States. According to a study by Ehrbar, many U.S. funds have accumulated a large quantity of unfunded liabilities as a result of earlier projections of too high real rates of return and too low real wage-growth assumptions.(37) Thus even though these private plans are assumed to be fully funded, they are, in fact, far from that.

One final point is worth making in the comparison between fully funded and pay-as-you-go systems. The notion that a growing public investment fund results in a higher national savings rate than a pay-as-you-go system holds true only during the accumulation period. That is, if the two systems were started from scratch, the contributions under a pay-as-you-go system would be just adequate to provide pension payments to existing retirement age individuals. Under a fully funded system, not only would contributions have to be made to support such individuals, but at the same time additional contributions would have to be made towards accumulating an investment fund that would generate the revenues to pay pensions to the current contributors. Consequently, the level of savings would be higher during the accumulation or early growth periods of a fully funded system.

But when both systems mature and, under similar assumptions, if the inflow of funds to the investment pool exactly equalled the outflows from the pool, the size of the investment pool would remain constant. Obviously, there would be no significant differences in the funding arrangements between full-investment funding and pay-as-you-go financing once the former fund stopped accumulating. As well, at maturity full-investment funding and pay-as-you-go financing would have similar effects on national savings.

In its accumulation stage, the investment pool would be expanding and, perhaps, under certain circumstances so would the nation's capital stock. But in light of the various comments we have made earlier, it is unlikely that the financing arrangements adopted would have any dramatic impact on the desired savings rate. However the de facto savings rate could decline if, during the accumulation phase of a public fund, the national economy weakened.

The macroeconomic effects of creating a fully funded system would depend upon the prevailing state of the economy during the accumulation phase and the rate at which funds accumulated. In order that the accumulation phase not have an adverse effect on the economy, it would be necessary for the economy to be continuously fully employed. As Lesnoy and Hambor note, "an increase in social security taxes would shift the budget in the direction of a surplus, increasing total saving in the

economy. However, increased saving will lead to a corresponding increase in capital formation only under conditions of full employment."(38) But Canada's economy is currently suffering from economic stagnation and high unemployment. The extra contributions to the fund, unless offset completely by other tax reductions, would lower aggregate demand for goods and services. Thus, at the margin, real economic growth would slow down and the unemployment rate would rise, depending upon the magnitude and speed of the accumulation phase. Lastly, investing the fund in equities would be difficult. According to Statistics Canada flow of funds data, the book value of the stock of equities in Canada in 1976 was $68.3 billion. But the estimates of the unfunded liability of the CPP in 1977 ranged between $81.3 and $84.4 billion according to calculations on the status of the CPP presented by the Department of Insurance.(39) The book value of the stock of equities outstanding is in fact below the theoretical level of unfunded liabilities of the CPP.

CONCLUSION

From our survey of the empirical and theoretical issues surrounding the appropriate means for financing a public pension system, we conclude that the assertion that the modified pay-as-you-go financing technique is inappropriate does not hold up under close analysis. The evidence on the impact of pay-as-you-go public pension financing on personal saving is so ambiguous that it should be ignored. In any event, personal savings account for a fairly small proportion of national savings in Canada even though the personal savings rate is presently at an all-time high, and thus the pension versus savings question is far from crucial. The related concern that the presently underfunded CPP/QPP has caused below optimum levels of capital formation in Canada should also be ignored as a real issue. The evidence supporting this proposition begins with the unfounded assertion that national savings are suboptimal and requires the acceptance of a variety of completely unrealistic assumptions about the Canadian economy. Indeed, we commented at some length on the lack of reliability and applicability of the assumptions linking theoretical long-term growth models to the Canadian economy.

As to the point that a fully funded CPP would generate a higher real rate of return to pension contributors, we note that this depends upon what, in our view, is an inappropriate series of rate-of-return comparisons. Critics of pay-as-you-go funding point out that the correct rate of return to be used in comparison between pay-as-you-go and funded systems is not the real rate of interest that has been earned in the past, but the social rate of return on capital. We argue that there is no reason to make such a sharp distinction between the social rate and the private real rate of return to capital measures in this context, since there is a supposition here that corporations, and not the individuals in the economic system, bear the burden of corporate taxes.

Further, in order to earn a return approximating the 10 per cent estimated real social rate estimated by Jenkins for Canada, the amount accumulated in a fully funded system would have to be invested solely in equities. As the data in Table 5 indicate, the real rate of return on equity investment has been rather dismal during the past five years, but on a fifty-year basis has been in the 5 to 6 per cent range, a level slightly in excess of the natural growth rate of the economy. If the fifty-year rate of return to equities were earned in the future, then investment of funds in equities under a fully funded system would be preferable to a pay-as-you-go system yielding a rate of return somewhere in the 3 to 4 per cent range; and, if that were the case, then the implicit real rate of return to a pay-as-you-go scheme appears about as attractive as substantial long-term public investment in equities. Under pay-as-you-go, there would not be the additional concern that a large public pension fund would swallow up most of the stock of equity capital in Canada.

Finally, there remains the problem of the extra large dose of economic deflation Canada would experience if full-investment funding were adopted when the economy already has a high volume of underutilized labour and capital. Indeed, though the plan might increase the volume of national savings by building up a large investment pool of funds, the effect could be quite the reverse, as the paradox of thrift would likely come into play.

NOTES

(1) "Statutory Actuarial Report No. 6 as of December 31, 1977." The Department of Insurance estimates that, with a continuous 3.6 per cent contribution rate, Canada's CPP fund would, on the basis of accompanying projections of benefits and expenses for the CPP (Fund A), become exhausted in the year 2003. For the fund to become a pure pay-as-you-go financed scheme, the contribution rate would have to rise between 1995 and 2050 to maintain a constant $34.7 billion fund (Fund C). The Royal Commission's own studies have CPP Fund C becoming a pure pay-as-you-go system after 1991, when that fund stabilizes at $36.1 billion.

(2) Martin Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation," Journal of Political Economy, 82 (1974), pp. 905-926; idem., "Perceived Wealth in Bonds and Social Security: A Comment," Journal of Political Economy, 84 (1976), pp. 331-336; idem., "Does the United States Save Too Little?" American Economic Review: Papers and Proceedings, 67 (1977), pp. 116-121; and Alicia H. Munnell, "Private Pensions and Saving: New Evidence," Journal of Political Economy, 84 (1976), pp. 1013-1032.

(3) Ontario Ministry of Treasury, Economics and Intergovernmental Affairs (TEIGA), The Economics of Financing National Pension Plans (Toronto, 1977); see also their Review of Issues in Financing the Canada Pension Plan (Toronto: Queen's Printer, 1976).

(4) Since 1966, CPP benefits have been financed out of contributions paid by both employers and employees. The contribution rate is currently 1.8 per cent of annual earnings for both contributors, subject to a basic exemption and a ceiling on earnings subject to pensionable earnings. The year's maximum pensionable earnings (YMPE) figure is $11,700 in 1979.

(5) See William H. Branson, Macroeconomic Theory and Policy (New York: Harper and Row, 1972), especially chapters 18 and 19.

(6) Edmund S. Phelps, "The Golden Rule of Accumulation: A Fable for Growth Men," American Economic Review, 51 (1961), pp. 638-643; and his "Second Essay on the Golden Rule of Accumulation," American Economic Review, 55 (1965), pp. 793-814.

(7) Paul A. Samuelson, "A Catenary Turnpike Theorem," American Economic Review, 55 (1965), pp. 486-496; and "A Turnpike Refutation of the Golden Rule," in K. Shell, ed., Essays on the Theory of Optimal Economic Growth (Cambridge, Mass.: MIT Press, 1967).

(8) Joan Robinson, Economic Heresies (New York: Basic Books, 1971).

(9) Stephen A. Marglin, "What Do Bosses Do? Part II," Review of Radical Political Economics, 7 (1975), pp. 20-37.

(10) Edward F. Denison, The Sources of Economic Growth and the Alternatives Before Us (New York: Committee for Economic

Development, 1962); and Thomas Wilson and Harvey Lithwick, The Sources of Economic Growth, Royal Commission on Taxation Study 24 (Ottawa: Queen's Printer, 1968).

(11) See J.M. Keynes, The General Theory of Employment, Interest and Money (New York: Macmillan, 1957).

(12) Feldstein, "Does the United States Save Too Little?"

(13) Ibid. See also Glenn P. Jenkins, Capital in Canada: Its Social and Private Performance, 1965-74, Economic Council of Canada Discussion Paper 98 (Ottawa, 1976). The rate of return as measured by Feldstein and by Jenkins is an average rate of return and not the marginal rate of return on capital. TEIGA used the Jenkins' rate of return figures to support their proposal for full investment funding of the CPP; see Review of Issues.

(14) Irving Fisher, The Theory of Interest (New York: Macmillan, 1930); Albert Ando and France Modigliani, "The 'Life-Cycle' Hypothesis of Saving: Aggregate Implications and Tests," American Economic Review, 53 (1963), pp. 55-84.

(15) Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation," p. 908.

(16) Marglin, "What Do Bosses Do?" p. 21.

(17) James Duesenberry, Income, Saving, and the Theory of Consumer Behaviour (Cambridge, Mass.: Harvard University Press, 1967).

(18) Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation"; Munnell, "Private Pensions and Saving."

(19) Marglin, "What Do Bosses Do?" p. 20.

(20) Ibid., p. 21.

(21) Phillip Cagan, The Effect of Pension Plans on Aggregate Savings: Evidence from a Sample Survey, National Bureau of Economic Research, Occasional Paper 95 (New York: Columbia University Press, 1965). It is possible that Cagan's sample was not representative of the general population in that Consumer Reports subscribers might have been more inclined to know about tax advantages for savings and hence saved more.

(22) George Katona, Private Pensions and Individual Savings, Survey Research Center, Institute for Social Research (Ann Arbor: University of Michigan Press, 1965).

(23) Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation."

(24) Munnell, "Private Pensions and Saving," p. 1030.

(25) Robert J. Barro, "Are Government Bonds Net Wealth?" Journal of Political Economy, 82 (1974), pp. 1095-1117.

(26) J. Ilkiw, Public Pensions and Personal Saving: Canadian Evidence in the Extended Life Cycle Model (Toronto: TEIGA, 1977).

(27) James Pesando and Samuel Rea, Jr., Public and Private Pensions in Canada: An Economic Analysis, Ontario Economic Council (Toronto: University of Toronto Press, 1977).

(28) Feldstein's time-series results would have been more reasonable and more in line with the implications of the life-cycle hypothesis if, instead of inserting wealth variables in a simple linear form, he had related the actual stock of wealth accumulated at a given point in time to the desired stock of wealth. In other words, as income levels and expectations increase over time, so too would the desired stock of wealth, and consequently each additional dollar increment to wealth need not have the same impact on aggregate consumption and savings as the previous dollar increment. In effect, under some circumstances, the marginal propensity to consume out of wealth would be a declining function of the stock of wealth.

(29) William R. Waters, "Pension and Savings Patterns," Canadian Perspective (September/October, 1977).

(30) Selig Lesnoy and John Hambor, "Social Security, Saving, and Capital Formation," U.S. Social Security Bulletin, July 1975.

(31) Robert Eisner (1977), "Capital Shortage: Myth and Reality," American Economic Review: Papers and Proceedings, 67, (1967), pp. 1110-1115; Feldstein, "Does the United States Save Too Little?" p. 119.

(32) TEIGA, The Economics of Financing National Pension Plans.

(33) This definition should be distinguished from the return to financial capital.

(34) Aaron has commented on the so-called social insurance paradox. That is, with a constant contribution rate under unfunded pay-as-you-go systems, the rate of return would be the growth rate of real wage payments (or real output). If that growth rate is in excess of the social rate of return, then the individual should prefer public pay-as-you-go financing to fully funded social security financing or private investment; Henry Aaron, "The Social Insurance Paradox," Canadian Journal of Economics and Political Science, (1966), pp. 371-374.

(35) Pesando and Rea, Public and Private Pensions in Canada, p. 130.

(36) The apparent discrepancy was 4.3 percentage points. Yet if our argument about the incidence of the corporate tax holds, then the differential, without a corporate tax, would likely be reduced because of a higher potential private return.

(37) A. Ehrbar, "Those Pension Funds Are Even Weaker than You Think," Fortune, 96 (1977), pp. 104-114.

(38) Lesnoy and Hambor, "Social Security, Saving, and Capital Formation," p. 14.

(39) Department of Insurance, "Statutory Actuarial Report No. 6, as of December 31, 1977" (Ottawa, 1978).

LIST OF TABLES

Table 1 - Selected Savings Ratios, 1962-77 164
Table 2 - Rate of Personal Savings and Inflation, 1962-77 166
Table 3 - Distribution of Savings and Gross Fixed Capital Formation, by Selected Groups and Periods, 1964-76 166
Table 4 - Investment/GNP Ratios, Selected OECD Countries, 1960, 1973, and 1977 183
Table 5 - Rates of Return on Capital, Canada, 1927-76 187
Table 6 - Real Rates of Return on Capital, United States, 1927-1976 187

Methodology and Assumptions Adopted For Canada Pension Plan Financial Projections Undertaken by the Royal Commission on the Status of Pensions in Ontario

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CONTENTS

List of Tables 198

Population Projections 200
- Mortality 200
- Fertility 202
- Immigration, Emigration and Migration 205
- Correlation of Immigration, Emigration and Migration Projections with Fertility Assumptions 207

Economic Assumptions 212
- Basis of Economic Assumptions (Arthur Donner) 212
- Application of Economic Assumptions 213

Other Assumptions 218
- Participation Rates 218
- Modified Average Earnings 218
- Contributions and Expenses of Administration 224
- Other Methodology and Assumptions Consistent with Those Adopted by the Department of Insurance 224
- Fund Accumulations 225

Entry Age Normal Cost and Related Unfunded Liability 225

Financial Projections Undertaken 226

Extra Population Arising From the Baby Boom 231

Old Age Security and Income Supplements 236
General Assumptions 236
Old Age Security Projection Method 237
GIS and SPA Projection Method 237
Assumptions for GIS/SPA Projection 238

Notes 240

LIST OF TABLES

Table 1 - Immigration, Emigration and Migration Assumptions 208
Table 2 - Distribution of Immigrants and Emigrants by Age Group 209
Table 3 - Immigrants to Canada, by Proportion Destined for Labour Force, by Class of Admission, 1968-1977 210
Table 4 - Comparison of 1976 Age/Sex Composition of Immigrants to Canada with Averages for Years 1959-1968 211
Table 5 - Economic Assumptions 215
Table 6 - Index for Real Wages in Canada 216
Table 7 - Real Rates of Return on Long-term Government of Canada Bonds 217
Table 8(a) - Zero YBE Participation Rates, Males, Canada Less Quebec 220
Table 8(b) - Zero YBE Participation Rates, Females, Canada Less Quebec 220
Table 8(c) - Zero YBE Participation Rates, Males, Ontario 221
Table 8(d) - Zero YBE Participation Rates, Females, Ontario 221
Table 9(a) - Adjusted T1 and T4 Reported Average Earnings, Males, Canada 222
Table 9(b) - Adjusted T1 and T4 Reported Average Earnings, Females, Canada 222
Table 9(c) - Adjusted T1 and T4 Reported Average Earnings, Males, Ontario 223
Table 9(d) - Adjusted T1 and T4 Reported Average Earnings, Females, Ontario 223
Table 10 - Actual and Adjusted Total Canadian Fertility Rates 233

Table 11 - Total Fertility Rates, Canada 234
Table 12 - Estimated Immigration to Canada 235
Table 13 - Extra Population in 1971 Resulting from High Fertility in 1945-65 Period (Canada) 235

Methodology and Assumptions Adopted for Canada Pension Plan Financial Projections Undertaken by the Royal Commission on the Status of Pensions in Ontario

This statement summarizes the methodology and assumptions adopted for Canada Pension Plan financial projections undertaken by the Commission. Included is documentation of the various projections undertaken, including funding alternatives beyond those customarily examined by the Federal Department of Insurance.

POPULATION PROJECTIONS

The population projections for the December 31, 1977 CPP financial projections were developed by forecasting changes in the 1971 census data. This was achieved by applying mortality factors (based on age and sex) to the 1971 census population to determine the number of deaths occurring each year and thereafter to the resultant surviving population through the year 2050.

Added to the projected population derived from the 1971 census data were new-born children (based on specified fertility rate assumptions) and immigrants to Canada. The latter were reduced by emigrants from Canada. Each of the immigrant/emigrant populations has separate age and sex characteristics.

Because the CPP excludes Quebec, separate population projections are required for Quebec to derive the net population (Canada less Quebec) needed for the CPP financial projections. Inherent in this analysis was the need to determine the percentage of immigrants that come to Quebec and the percentage of emigrants that depart, and of those who migrate from Quebec to the rest of Canada (or vice versa), along with assumptions for their age and sex composition.

Financial projections desired for the Ontario population required the development of projections for Ontario in a manner consistent with the way in which Quebec populations were developed.

Mortality

The Life Table 1970-72, Canada, published by Statistics Canada, was assumed applicable to 1971. Mortality thereafter was assumed to improve to an ultimate mortality table applicable to the year 2050. Intermediate years were obtained by geometric interpolation. These rates were assumed to apply to Canada and Quebec. Corresponding Quebec mortality rates were used in developing the required Quebec population used to arrive at the Canada less Quebec population. Life expectancies for Canada and Ontario produced from these mortality rates are as follows:

	1971		2050	
	Males	Females	Males	Females
At birth	69.3	76.4	73.1	81.2
From age 65	13.7	17.5	16.0	20.7

Census data for 1971 were used for projection purposes rather than the 1976 census data due to the fact the latter were not available early enough to use as a base for projection purposes.

Comments

The mortality rates adopted were identical to those developed by the Department of Insurance for the December 31, 1977 CPP population projections.(1) Mortality rates applicable to the year 2050 were based on a study by the U.S. Social Security Administration (Actuarial Study No. 77). This study developed rates of mortality for the year 2050 by considering death rates by age groups and sex for 10 broad cause of death groupings. The assumed percentage reductions for each cause of death were combined to produce an average reduction in mortality by age and sex for all 10 causes of death. Since the base year for projections for the CPP was 1971, it was necessary to compare the rate of improvement in U.S. mortality rates from 1971 to 2050 and to apply such improvement to Canadian mortality rates applicable in 1971.

Projections for future mortality improvement embodied in the U.S. Actuarial Study No. 77 provided for more modest mortality improvements than used in prior mortality projections of the CPP by the Department of Insurance.

This change is consistent with the general levelling-off of death rates at most ages in the 1960s but is not consistent with the trend started in 1976 where mortality rates started to come down again as the result of such factors as:

- A cut-back in the number of people smoking;

- A reduction in highway speed limits; and

- The requirement in some provinces for the wearing of seatbelts.

Whereas the last two items reduce the number of accidental deaths - the largest cause of death for those under age 35 where mortality is already very low - the reduction in smoking probably has a more marked impact on the mortality rates of older members of the population.

While there has been a marked mortality improvement at the younger and middle ages, there has been a less marked change at the older ages. Thus, although it is reasonable to assume that the present rate of improvement in longevity will continue as the result of advances in

medicine and public health, an eventual slow-down in longevity improvement will undoubtedly occur at some point 20 to 25 years from now.

For these reasons, we believe the mortality projections developed by the Department of Insurance are appropriate for the CPP population projections.

Projections by the U.S. Social Security administration also assume that the gap between male and female mortality will continue to grow, on the theory that females will not react to stress the way males have done. We concur with this viewpoint.

The Commission considered the possible impact of a sudden improvement in mortality as the result of a significant medical breakthrough. In fact, the mortality improvements developed by the U.S. Social Security Administration anticipated medical breakthroughs on a modest scale. This alternative was not explored since it was recognized that any such result would probably bring about a corresponding change of major proportions in the CPP design, such as an increase in the age at which government pensions first commence.

Mortality rates for Ontario and Canada residents were assumed to be identical, since an examination of current rates of survival to age 65 and life expectancies after age 65 indicated little difference for the two populations. Separate rates for Quebec were used due to the fact mortality rates historically have been higher in that province.

Fertility

The net reproduction rates used for four fertility scenarios developed by the Commission with its sociologist, Daniel Kubat, are summarized below:

	Net reproduction rates (NRR)			
	Low/Low	Low	Most probable	High
1971 to 1974	actual: ------- Canada for Canada projections------ Ontario for Ontario projections Quebec for Quebec projections			
1975 to 1985	---------- By linear interpolation---------			
1985	.90	1.00	1.20	1.45
1990	.90	1.00	1.10	1.30
1995	.90	1.00	1.00	1.15
2000+	.90	1.00	1.00	1.00

Note: Intervening rates for years 1985 to 2000 obtained by interpolation.

The net reproduction rates for 1971 to 1974 for Canada, Quebec, and Ontario were based on actual rates obtained from Statistics Canada. Rates for 1975 through 1984 were interpolated linearly from the 1974 and 1985 values. Rates for 1985 and later years were assumed to apply to Canada, Quebec, and Ontario. Note that a net reproduction rate of 1.00 means that every female born alive will bear one female child. In all cases, the distribution of the age-specific fertility rates used was that of the three-year average for 1970-72 by geographical region, with the total of such rates adjusted to produce the assumed total fertility rate in each calendar year.(2)

In this connection it should be noted that a net reproduction rate of 1.00 equates to approximately a total fertility rate of 2.112, i.e., 2.112 is the average number of live births to females.

Comments

In developing his projections for fertility rates, Kubat noted that fertility had been decreasing and, starting in 1972, had reached values below unity as depicted in the table below:

	Gross reproduction rates		
	Canada	Quebec	Ontario
1931	1.555	1.940	1.285
1941	1.307	1.645	1.164
1951	1.701	1.834	1.560
1956	1.874	1.892	1.780
1961	1.868	1.787	1.824
1966	1.369	1.284	1.361
1971	1.060	.908	1.078
1972	.982	.836	.993
1973	.937	.812	.952
1974	.891	.806	.915

Source Vital Statistics, Vol. 1, 1974, Cat. 84-204.

In developing his most probable scenario for fertility rates, Kubat postulated that the net reproduction rate would not only return to unity by 1985, but would probably reach a level of 1.20 due to what he referred to as the baby boom echo. He noted that women born during the baby boom have begun to show a trend toward higher fertility rates. This has been evidenced by a higher age-specific fertility (number of children born per 1,000 women annually) for women in 1970. This has commenced notwithstanding the fact that overall fertility rates are still declining. In his view, these statistics evidence a partial postponement of child-bearing rather than a total cessation. He suggested that this trend would probably continue through 1990 and lead to a net reproduction of 1.00 in the year 2000.

Kubat's rationale for an eventual net reproduction of 1.00 in all four fertility scenarios (which is equivalent to zero population growth eventually, i.e., by the time persons born today start to die) is based on the following comments that he made to the Commission:

> "Actuarially, assuming perfect replacement (one daughter per female over the life span of the female), is a feasible assumption for any population projection dealing with long term spans; any growth, positive or negative, is exponential and difficult to imagine. On the other hand, the history of population does not offer any evidence of a sustained zero growth. The close to zero growth for thousands of years in the past was due primarily to dramatic fluctuations in mortality which wiped out substantial populations at different time intervals. Sociologically, one has to expect fluctuations in fertility behavior around a net replacement ratio of 1, fluctuations which are more likely to stay above unity than below unity. In other words, if most women have children, the probability that they will have more than two children is fairly great. Current fertility, which is at a net replacement ratio of 1, or slightly below 1, is a statistical artifact of the number of women who have no children and women who have more than two, the resulting social differences in disposable income resulting from this distribution are bound to increase the proportion of women without children. On the other hand, 'a climate of optimism' or a return to more traditional values may bring a turnabout in fertility, attracting the previously childless women into child-bearing and increasing thus the overall fertility to levels substantially above unity for net replacement ratios."

In his high fertility scenario Kubat assumed that there could be a potential snowballing effect of a rise in fertility by the very large cohorts of children reaching child-bearing age in the next several years. He anticipates an increase in net reproduction rates to 1.45 in 1985, declining to 1.00 by the year 2000.

In his low fertility scenario he assumed a return to a net reproduction rate of 1.00 by 1985 and no change therafter.

For these reasons we subscribe to his theory that ultimately a net reproduction rate of one is the only meaningful fertility assumption, barring unforeseen circumstances such as a major war or epidemic.

A low/low scenario has also been introduced by the Commission to measure the financial effect on the CPP if fertility rates continued indefinitely at current levels, that is, at a net reproduction rate of .90.

Immigration, Emigration and Migration

Table 1 outlines the assumptions used for immigration, emigration, and migration for the three geographical regions - Canada, Quebec, and Ontario. Immigration figures for years 1971 to 1977 are actual results, whereas the emigration figures are estimates made by Kubat. For 1978, immigration to Canada was taken at 100,000 with Quebec assumed to receive 15 per cent and Ontario 50 per cent. Emigration from Canada for 1978 was taken as 40,000 with Quebec assumed to lose 25 per cent of this number and Ontario 40 per cent. For calendar years after 1978, the 100,000 and 40,000 figures were increased 1/2 of 1 per cent per year through the year 2000 when these absolute amounts were frozen. Thus, net Canadian immigration was set at 60,000 in 1978 and 66,960 in 2000 and later.

Migration from Quebec to Canada was taken at 22,017 in 1971 (the actual number) and graded linearly to an assumed level of 20,000 in 1978 and 5,000 in 2000 and later. Zero net migration was assumed from Ontario to the rest of Canada. The assumptions assume net outflows from Quebec to the rest of Canada as follows:

	Immigration	Emigration	Migration	Net Outflow
1971	19,222	16,500	22,017	19,295
1978	15,000	10,000	20,000	15,000
2000 and later	16,740	11,160	5,000	-580

Distribution of immigrants by age and sex were obtained from "Analytical and Technical Memorandum No. 6: Migration Projections for Canada", by K.S. Gnanasekaran (Statistics Canada). Since statistics on emigrants are not maintained, the distribution of emigrants by age and sex was based on the distribution of emigrants to the United States from Canada obtained on a continuous basis by Statistics Canada from the U.S. Department of Justice. It is noted that emigrants from Canada to the United States have comprised approximately two-thirds of immigration to the United States in recent years. Immigrants over age 65 were ignored in order to avoid a substantial overstatement of benefits in respect of immigrants. These distributions are shown in Table 2.

Comments: Immigration and Emigration

In his submission to the Commission, Kubat indicated that the assumption by the Department of Insurance for its CPP valuation (December 31, 1977) of 160,000 immigrants and 60,000 emigrants would lead to a net immigration assumption (100,000) that is too high. His view was that "net" immigration should be closer to 60,000 rather than 100,000 starting in the calendar year 1978. Kubat recommended that we assume annual immigration of 100,000 and emigration of 40,000, both of these figures to increase by 1/2 of 1 per cent per year from 1978 to the year 2000 (to net about 67,000) and remain constant thereafter. The

Department of Insurance's "net" immigration figure applied to 1971. It increased thereafter in such a way that it would remain constant as a percentage (.465 per cent) of the total population.

Kubat explained that until about 1990 we could expect to see a continuation of the influx of "dependent" versus "independent" immigrants to Canada. The age and sex distributions of immigrants being used by the Department of Insurance (developed by Gnanasekaran) are based on averages developed over the period 1959-68. As can be seen from Table 3, the proportion of independents that emigrated to Canada in the period 1959-68 and ended up as workers, hovered around 60 per cent. But starting with 1975, the percentage of independents who ended up as workers fell markedly to a low of 50 per cent in 1977. This analysis suggests that there may have been a change in the average age/sex composition of immigrants to Canada starting with 1975. An examination of Table 4 shows that there has been a change, with a heavier number of dependents coming to Canada in 1976 versus the period 1959-68. Overall, however, there has not been a significant change.

The revised immigration policy that took effect in early 1978 permits the Canadian government to establish numerical targets for immigration each year. Although this legislation retains its non-discriminatory features, it has dropped the "nominated" relative category. (It is also interesting to note that the first immigration target level for 1979 was set at 100,000). This will undoubtedly lead to a return to a higher proportion of independents emigrating to Canada sometime in the 1980s and a return to the 1959-68 immigration experience. Accordingly, Kubat has recommended that the age and sex distributions being adopted by the Department of Insurance be used for projections required by the Commission. In his view, the use of two tables covering the age and sex composition of immigrants, one to say 1990 and another one thereafter, hardly seems practical when one considers how little it will affect the overall financial projections.

Comments: Migration

In his submission, Kubat suggested that 15 per cent of all immigration to Canada will be to Quebec with 25 per cent of all emigration from Canada being from Quebec. In its December 31, 1977 population projections, the Department of Insurance used 17.33 per cent for 1971, grading to 25 per cent in 2000 for immigration, and 29.84 per cent for 1971 grading to 25 per cent in 2000 for emigration. Actual immigration figures for 1971 to 1977 were used in the projections made for the Commission, rather than using the interpolative approach adopted by the Department of Insurance.

Starting in 1978, immigration to Quebec was assumed to occur at a level equal to 15 per cent of all immigration to Canada in contrast to the 25 per cent figure adopted by the Department of Insurance. The

following information produced by Kubat supports the use of a 15 per cent assumption:

	Per cent of all foreign-born residing in Quebec	Per cent of all population residing in Quebec
	(Per cent)	
1931	10.9	27.7
1941	11.1	28.9
1951	11.1	28.8
1961	13.7	28.8
1971	14.2	27.9

In 1975 and 1976, the proportion of immigrants declaring Quebec as their intended province of residence was 14.9 per cent and 19.6 per cent respectively. According to Kubat,

> "The current drive by Quebec to recruit immigrants from abroad may yield some immigrants who will state their intent to come to Quebec and settle there. However, more likely than not, a proportion of such immigrants, unless they are fully francophone, will find their way to Ontario or other provinces."

For the foregoing reasons he views the 15 per cent assumption as a realistic one.

Net migration to Ontario historically has been positive but recently has become slightly negative. Kubat's view is that net migration for Ontario will most likely fluctuate around a zero value.

Correlation of Immigration, Emigration and Migration Projections with Fertility Assumptions

In discussions, Kubat commented that the immigration, emigration and migration projections should parallel or mirror the fertility assumptions used for the various scenarios. This process can be rationalized by recognizing that, under the new immigration policy, the federal government will be establishing quotas which will reflect the number of youth becoming available for jobs in the market place. Consequently, higher fertility rates under one scenario will, approximately 20 years later, lead to a possible reduction in the number of immigrants allowed to enter Canada.

Although this correlation is desirable, it was decided that this kind of "fine tuning" was not that important in the projection process, particularly when it is realized that its first impact is at least 20 years into the future. Consequently, it was decided that the immigration, emigration and migration assumptions should apply to all four fertility scenarios.

Table 1
Immigration, Emigration and Migration Assumptions

Immigration	Canada	Quebec	Ontario
1971	121,900	19,222	64,357
1972	122,006	18,592	63,805
1973	184,200	26,871	103,187
1974	218,465	33,458	120,115
1975	187,881	28,042	98,471
1976	140,429	29,282	72,031
1977	114,914	19,248	56,594
1978 and later	100,000(a)	15 per cent of Canada	50 per cent of Canada
Emigration			
1971	55,000	30 per cent of Canada	42 per cent of Canada
1972	48,000	30 per cent of Canada	42 per cent of Canada
1973	44,000	30 per cent of Canada	41 per cent of Canada
1974	40,000	28 per cent of Canada	40 per cent of Canada
1975	38,000	23 per cent of Canada	44 per cent of Canada
1976	40,000	21 per cent of Canada	45 per cent of Canada
1977	40,000	25 per cent of Canada	40 per cent of Canada
1978 and later	40,000(a)	25 per cent of Canada	40 per cent of Canada
Migration	Quebec to Canada(b)	Ontario to Canada	
1971	22,017	Ø	
1978	20,000	Ø	
2000 and later	5,000	Ø	

a Increases by 1/2 of 1 per cent per year through the year 2000.
b Graded linearly from 1971 to 1978 and from 1978 to 2000.

Source The Royal Commission on the Status of Pensions in Ontario, prepared from material supplied by Daniel Kubat.

Table 2
Distribution of Immigrants and Emigrants by Age Group

Age group	Immigrants		Emigrants	
	Males	Females	Males	Females
	(Per cent)			
0-4	4.879	4.607	6.365	5.985
5-9	4.176	3.903	5.053	5.069
10-14	2.948	2.808	3.532	3.447
15-19	3.758	4.096	2.689	3.596
20-24	8.969	10.470	3.601	8.881
25-29	9.147	8.049	6.436	7.240
30-34	5.728	4.838	6.097	5.105
35-39	3.699	3.123	4.861	3.826
40-44	2.189	1.931	3.199	2.755
45-49	1.316	1.371	2.143	1.846
50-54	.927	1.226	1.397	1.480
55-59	.694	1.157	.939	1.072
60-64	.530	1.012	.539	.721
65-69	.471	.755	.429	.532
70 plus	.427	.796	.499	.675
All ages	49.858	50.142	47.779	52.221

Source The Royal Commission on the Status of Pensions in Ontario, prepared from material supplied by Daniel Kubat.

Table 3
Immigrants to Canada, by Proportion Destined for Labour Force, by Class of Admission, 1968-1977

	All immigrants		Distribution and proportion workers per class of admission					
	Workers		Sponsored(a)		Nominated(a)		Independent(a)	
	(Number)	(Per cent)	(Thousands)	(Per cent)	(Thousands)	(Per cent)	(Thousands)	(Per cent)
1968	183,974	52	38.3	17	35.0	54	110.6	64
1969	163,531	52	33.5	20	39.1	56	88.9	63
1970	147,713	53	32.2	20	35.1	56	80.3	64
1971	121,900	50	33.5	22	29.3	57	59.1	63
1972	122,006	49	33.1	23	30.9	57	58.0	59
1973	184,200	50	42.0	21	53.2	54	97.5	61
1974	218,465	50	54.3	20	44.7	53	110.9	61
1975	187,881	43	64.3	21	47.0	52	76.6	55
1976	149,429	41	61.8	27	38.6	52	49.0	51
1977	114,914	41	52.3	30	28.7	54	33.8	50

a Sponsored (close relatives); Nominated (relatives not in the sponsored category) independent (other immigrants)

Source Manpower and Immigration. Canadian Immigration and Population Study; Immigration and Population Statistics. (Ottawa, 1974). Employment and Immigration Canada, unpublished data.

Table 4
Comparison of 1976 Age/Sex Composition of Immigrants to Canada with Averages for Years 1959-1968

Age Group	Males			Females		
	1959-1968-	1976	Difference	1959-1968	1976	Difference
	(Per cent)					
0-4	10	9	-1	9	7	-2
5-9	8	10	+2	8	9	+1
10-14	6	8	+2	6	8	+2
15-19	8	9	+1	8	8	-
20-24	18	13	-5	21	17	-4
25-29	18	13	-5	16	16	-
30-34	12	10	-2	10	9	-1
35-39	7	7	-	6	5	-1
40-44	4	4	-	4	3	-1
45-49	3	3	-	3	3	-
50-54	2	2	-	2	3	+1
55-59	1	2	+1	2	3	+1
60-64	1	3	+2	2	4	+2
65-69	1	2	+1	2	3	+1
70+	1	2	+1	2	3	+1
Total	100	100	-	100	100	-

Source The Royal Commission on the Status of Pensions in Ontario, prepared from material supplied by Daniel Kubat.

ECONOMIC ASSUMPTIONS

Projections of real wages and salaries, real investment return and inflation were developed by the Commission's economist, Arthur Donner. His assumptions are explained below, followed by a discussion of their application in arriving at a complete economic basis for the Commission's projections.

Basis of Economic Assumptions (Arthur Donner)

Actuarial calculations for the CPP, or for any pension plan, require a series of economic assumptions for the forecast period. The critical economic variables in such projections are the rates of change in wages (specifically the industrial composite wage index), rates of change in prices (the CPI), and nominal interest rates (yields on provincial or federal government long-term securities). While the projected levels of future wages, prices, and interest rates are important, their relative importance is also evident in their so-called "real counterpart" measures (real wages and real interest rates). Over the longer term the nominal values for any economic variables are interrelated as high rates of inflation tend to be associated with higher nominal interest rates, and, in turn, faster inflation translates into more rapid rates of increase in money wages.(3)

Three inflation scenarios are set out in Table 5; a most probable inflation scenario which has the average rate of inflation only minimally decelerating between 1978 and 1984, a high probable inflation scenario which has inflation remaining at a very high rate by historical standards until 1984, and a low probable inflation scenario which has inflation moderating at a 4-1/2 per cent average rate between 1980 and 1984, and a 4 per cent average rate between 1985 and 1989. In all three cases, a constant rate of inflation is assumed beyond 1990.

The rationale for the central or most probable inflation projection is partly based on the view that inflation, over the longer run, is a purely monetary phenomenon determined primarily by the long-term growth rate of the money supply less the long-term growth rate of full capacity national production. One must be aware that in the shorter time horizon, price adjustments to particular factors such as energy costs, food costs, and a depreciated currency can worsen recorded inflation rates. The shorter-run shocks are assumed to fully work themselves out by the early 1980s.

As well, governments (whether national or provincial) and the Bank of Canada have introduced a series of policy measures which, if extended into the 1980s, are consistent with lower average rates of inflation in the 1980s than in the late 1970s. Thus the most probable inflation scenario has prices moderating from their near two-digit level increases in the late 1970s down to a 5.5 per cent average annual rate of increase

between 1980 and 1984, a 5 per cent average annual rate of increase 1985-1989, and a 4 per cent average annual rate of increase thereafter.

The three inflation scenarios differ from each other in a related way. The high-inflation case has prices and wages inceasing at a two percentage point faster than the comparable figures for the most probable case. The low-inflation scenario records prices and wages rising at a 1 per cent lower rate than the most probable projection. Nominal interest rates in the high and low-inflation scenarios were similarly projected relative to the most probable case. That is, in the high scenario, future nominal interest rates are 200 basis points in excess of the most probable case, and 300 basis points in excess of the low-inflation case.

After 1990, it was assumed that real wages and real long-term interest rates would trend at a constant rate in all scenarios, consistent with the wage and price inflation forecast. But prior to 1985 some allowance was made in these projections for the poorer real rates of return to bonds in the high-inflation case, and the improved real rates of return to bonds in the low-inflation case.

The constant real interest rate and real wage rate projections beyond 1990 are based on historical long-term trends. If the distribution of income is to remain relatively constant in the future, then real wages must trend at a rate of growth similar to that of real output per worker. Thus, the historical long-term gain in real wages of 2.1 per cent per annum after 1990 which was adopted in these projections is consistent with a 50-year average experience, as well as with a historical average rate of growth for real output per worker. In a similar way, the three series of projections generate a 2.4 per cent per annum real interest rate return after 1990, since this has tended to be the long-term real rate of return to these particular provincial securities.

Application of Economic Assumptions

The long-term assumption of 2.1 per cent real growth in wages and salaries was based on a 50-year analysis of the Statistics Canada Average Weekly Wages and Salaries Industrial Composite Index. Table 6 demonstrates that a trend line of 2.1 per cent provides a very close fit to the 50-year experience of real growth in wages and salaries.

The CPP fund is invested using interest rates that reflect those on long-term Government of Canada bonds (terms of 20 years and longer). The long-term trend line for real rates of return on long-term Canada bonds (10 years term and over) is 2.25 per cent (see Table 7). This was estimated to be 2.40 per cent if 20-year and over Canada bonds were used. For Ontario, it was recommended by Donner that real rates of investment return be set .4 of 1 per cent higher than for Canada on the assumption that if Ontario set up its own pension plan, the interest

rate would be geared to Ontario long-term bonds, rather than Canada long-term bonds.

Inflation has been assumed ultimately (1990) to reach 4.0 per cent under the most probable forecast, with an ultimate level of 3.0 per cent on the low level and 6.0 per cent on the high economic forecasts. The ultimate (1990 and later) forecasts are summarized below:

	1990 and later forecasts		
Annual rates of return	Low	Most probable	High
		(Per cent)	
1. Investment return	5.4	6.4	8.4
2. Growth in wages and salaries	5.1	6.1	8.1
3. Inflation	3.0	4.0	6.0
4. Real rates of investment return = (1) - (3)	2.4	2.4	2.4
5. Real growth in wages and salaries = (2) - (3)	2.1	2.1	2.1

Two alternative projections were made relating closely to the most probable economic scenario. These additional projections adjusted the real growth in wages and salaries up to 1/2 of 1 per cent and down 1/2 of 1 per cent for calendar years 1979 and later, while keeping the inflation rates the same. This had the effect of maintaining the real investment rates of return at 2.4 per cent but changing the ultimate (1990 and later) growth in real wages and salaries - in the one case from 2.1 per cent to 1.6 per cent and in the second case to 2.6 per cent. The total growth rates for salaries and wages were thus 5.6 per cent and 6.6 per cent respectively rather than 6.1 per cent.

Comments

The Department of Insurance CPP financial projections embodied a real investment return of 3.0 per cent in 1973 and later, as contrasted to the 2.4 per cent figure used by the Commission. Based on the historical trend line depicted in Table 7, it is difficult to justify a 3 per cent real rate of return. However, it should be recognized that this assumption only has a bearing on the relative size of the CPP fund, and in the instance where only a modest fund is developed, this factor has little impact on the financial projections. The real growth in wages and salaries on the other hand, is a critical variable since it affects the growth in the YMPE which in turn affects both benefit levels and contributions. Here the assumption of 2.1 per cent (based on the trend line obtained from Table 6) used for the Commission's projections is very close to the 2.0 per cent figure adopted by the Department of Insurance.

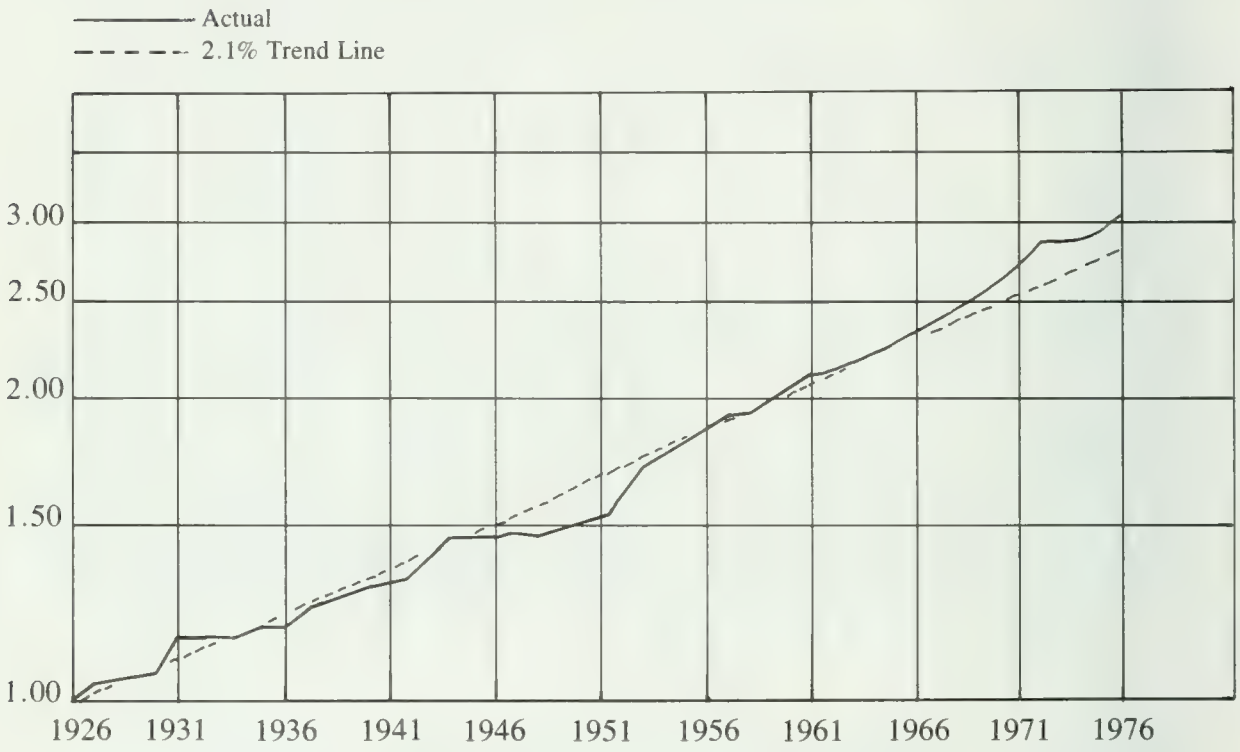
Table 5
Economic Assumptions

	Inflation	Wages and salaries		Interest rates(a)	
		Real growth	Total growth	Real return	Total return
		(Per cent)			
Most probable economic scenario					
1978	7.3	-.3	7.0	1.7	9.0
1979	6.0	2.0	8.0	2.3	8.3
1980-84	5.5	1.8	7.3	2.4	7.9
1985-89	5.0	2.0	7.0	2.6	7.6
1990 and later	4.0	2.1	6.1	2.4	6.4
High probable economic scenario					
1978	9.3	-.3	9.0	1.2	10.5
1979	8.0	2.0	10.0	1.8	9.8
1980-84	7.5	1.8	9.3	2.4	9.9
1985-89	7.0	2.0	9.0	2.6	9.6
1990 and later	6.0	2.1	8.1	2.4	8.4
Low probable economic scenario					
1978	6.3	-.3	6.0	1.8	8.1
1979	5.0	2.0	7.0	2.5	7.5
1980-84	4.5	1.8	6.3	2.5	7.0
1985-89	4.0	2.0	6.0	2.7	6.7
1990 and later	2.0	2.1	5.1	2.4	5.4

a Based on long-term government bond index (10 years and over) increased by .3 of 1 per cent to adjust to Government of Canada bonds with terms of 20 or more years.

Table 6

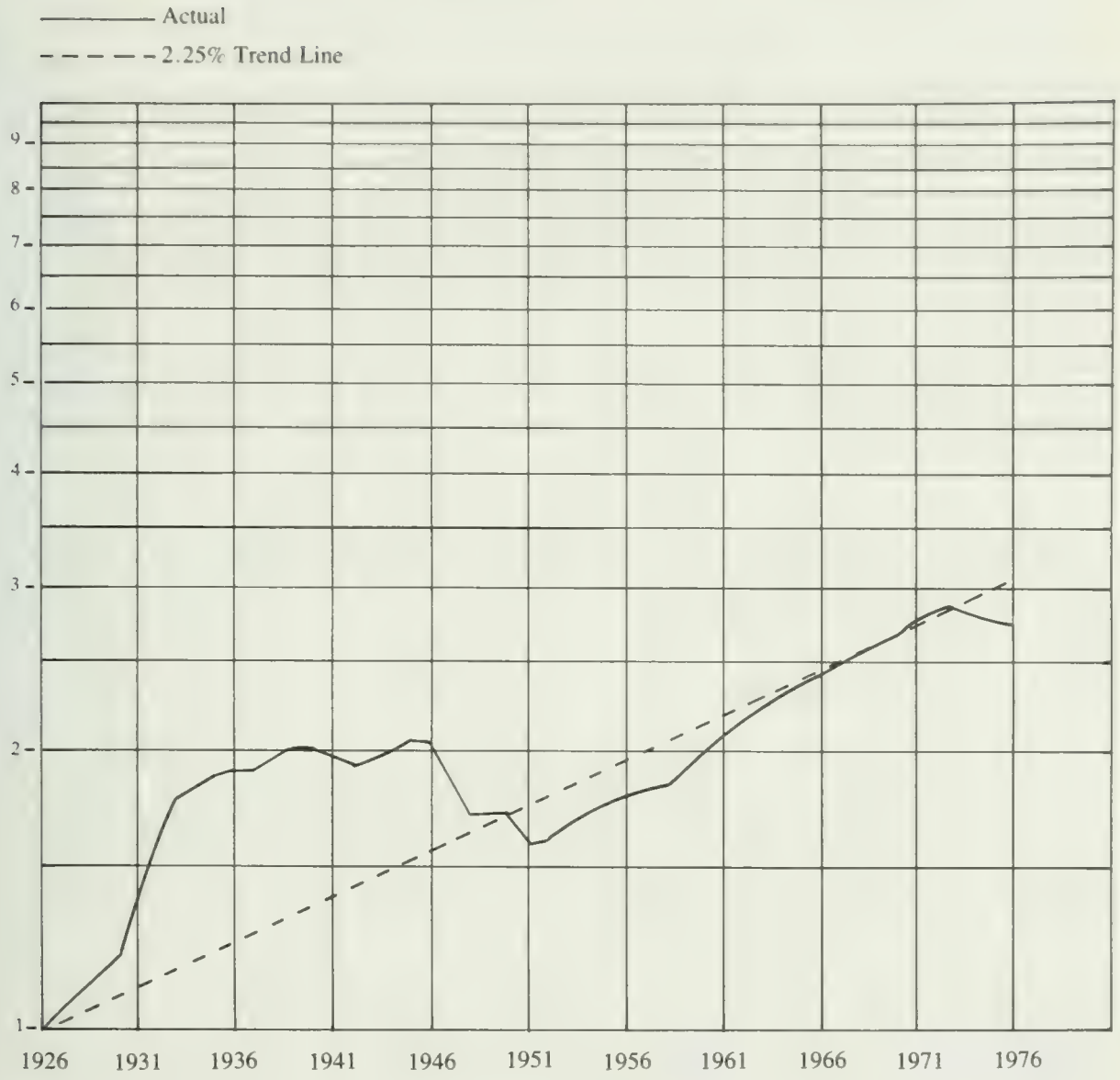
INDEX FOR REAL WAGES IN CANADA



Source Statistics Canada, *Average Weekly Wages & Salaries, Industrial Composite Index.*

Table 7

REAL RATES OF RETURN ON
LONG-TERM GOVERNMENT OF CANADA BONDS



Source Bank of Canada Review
(Bonds have terms of 10 years and longer)

OTHER ASSUMPTIONS

Here we will describe the other assumptions used in performing the CPP financial projections requested by the Commission.

Participation Rates

Participation rates for 1971 to 1975, assuming a zero Year's Basic Exemption (YBE), were developed from data obtained from the CPP Division of the Department of Supply and Services, by dividing the total number of contributors by the projected population in each calendar year age-group sex cell (11 groups for each sex). These were developed for Canada (less Quebec) and Ontario. Participation rates for 1966 to 1970 were developed from similar but not identical data. Participation rates for calendar years 1980, 1990, and 2000 and later were projected with the help of the Commission's sociologist. The participation rates developed are shown in Table 8. Intermediate year participation rates were obtained by interpolation.

On examining Table 8, it can be seen that some participation rates exceed 100 per cent. This is attributable to the fact that there are temporary workers in the country in any year who do not show up in the population counts.

The zero YBE participation rates were adjusted to YBE participation rates by the use of cumulative distributions of contributors and earnings for the 11 age-group sex cells. Some eighty earnings ranges are used for each age-group sex cell.

Modified Average Earnings

For calendar years 1971 to 1975, average earnings were developed assuming a zero YBE for each calendar year age-group sex cell by dividing total earnings by the total number of contributors in each sex cell. These were developed for both Canada (less Quebec) and Ontario, and extended back to 1966 using similar but not identical data. These average earnings are shown in Table 9.

For calendar years 1976 and 1977, it was assumed that total average earnings (for all age-groups and both sexes combined) would increase at the same annual rate as the Industrial Composite Index of Average Wages and Salaries. For 1978 and later years, the rates postulated in the economic assumptions were applied. After discussions with the Commission's sociologist it was decided that no differentiation should be made in the relative positioning of wages and salaries by age and/or sex in future years.(4)

Modified average earnings, reflecting only earnings above the projected YBE and up to the projected YMPE in each calendar year, were

developed using the cumulative distributions of contributors and earnings described above in "Participation Rates."

The effect of unemployment was not explicitly introduced into the calculations.

Table 8(a)
Zero YBE Participation Rates, Males, Canada Less Quebec

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1980	1990	2000
18-19	.825	.828	.869	.822	.791	.829	.875	.899	.911	.931	.940	.940	.940
20-24	1.022	.993	1.032	1.007	1.010	.978	.995	1.004	1.009	.988	1.005	1.005	1.005
25-29	1.041	1.039	1.061	1.043	1.008	1.018	1.022	1.021	1.036	1.032	1.030	1.030	1.030
30-34	.934	.954	.998	.996	.994	.991	.998	.995	.981	.980	.990	.990	.990
35-39	.927	.944	.986	.980	.963	.964	.968	.977	.977	.982	.990	.990	.990
40-44	.920	.915	.955	.947	.954	.963	.972	.964	.959	.955	.970	.970	.970
45-49	.943	.932	.975	.968	.939	.929	.949	.949	.949	.954	.960	.960	.960
50-54	.879	.866	.903	.879	.903	.924	.933	.930	.926	.920	.930	.930	.930
55-59	.901	.863	.893	.885	.868	.861	.868	.876	.875	.889	.890	.890	.890
60-64	.829	.776	.812	.793	.790	.798	.804	.795	.791	.777	.800	.800	.800
65-69	.604	.523	.544	.513	.458	.441	.432	.429	.424	.426	.400	.375	.350

Table 8(b)
Zero YBE Participation Rates, Females, Canada Less Quebec

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1980	1990	2000
18-19	.667	.672	.711	.672	.659	.691	.747	.773	.795	.824	.835	.850	.860
20-24	.749	.711	.764	.759	.757	.736	.766	.785	.806	.815	.820	.835	.855
25-29	.518	.507	.559	.569	.569	.594	.607	.624	.648	.674	.760	.785	.790
30-34	.379	.405	.452	.463	.480	.492	.519	.539	.561	.576	.690	.720	.725
35-39	.381	.415	.456	.463	.471	.485	.506	.538	.569	.598	.690	.720	.725
40-44	.421	.443	.475	.476	.487	.498	.518	.536	.561	.581	.690	.720	.725
45-49	.462	.470	.498	.500	.490	.488	.504	.519	.539	.558	.635	.660	.665
50-54	.420	.422	.447	.441	.456	.470	.479	.486	.501	.507	.545	.570	.580
55-59	.388	.376	.392	.379	.394	.392	.398	.409	.420	.440	.485	.510	.520
60-64	.279	.265	.208	.286	.294	.303	.306	.304	.308	.309	.330	.400	.480
65-69	.150	.135	.139	.137	.129	.134	.128	.127	.125	.135	.150	.180	.210

Table 8(c)
Zero YBE Participation Rates, Males, Ontario

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1980	1990	2000
18-19	1.092	1.027	.949	.877	.837	.851	.902	.931	.916	.891	.900	.900	.900
20-24	1.082	1.091	1.088	1.062	1.053	1.003	1.017	1.028	1.010	.965	1.000	1.000	1.000
25-29	1.085	1.112	1.092	1.075	1.039	1.043	1.045	1.041	1.023	1.005	1.010	1.010	1.010
30-34	1.014	1.015	1.019	1.022	1.022	1.011	1.017	1.004	.976	.963	.980	.980	.980
35-39	.996	1.010	1.003	1.001	.986	.981	.987	.992	.983	.978	.980	.980	.980
40-44	.991	.990	.975	.971	.980	.981	.984	.978	.968	.956	.965	.965	.965
45-49	.981	1.010	1.011	1.001	.975	.956	.969	.964	.966	.965	.965	.965	.965
50-54	.947	.961	.928	.915	.943	.964	.966	.960	.951	.939	.950	.950	.950
55-59	.945	.949	.934	.931	.912	.905	.899	.899	.897	.911	.900	.900	.900
60-64	.857	.850	.853	.842	.838	.837	.833	.822	.817	.799	.810	.810	.810
65-69	.625	.522	.587	.562	.506	.493	.448	.445	.428	.398	.400	.375	.350

Table 8(d)
Zero YBE Participation Rates, Females, Ontario

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1980	1990	2000
18-19	.888	.865	.794	.732	.717	.741	.804	.823	.814	.779	.835	.850	.860
20-24	.815	.830	.844	.832	.821	.779	.816	.834	.853	.850	.850	.865	.890
25-29	.557	.604	.632	.636	.632	.652	.661	.673	.682	.703	.775	.800	.810
30-34	.472	.497	.516	.520	.539	.547	.572	.585	.596	.608	.700	.725	.735
35-39	.490	.518	.517	.515	.522	.534	.551	.583	.610	.637	.700	.725	.735
40-44	.523	.538	.534	.527	.537	.545	.562	.580	.604	.622	.700	.725	.735
45-49	.524	.557	.561	.554	.541	.534	.546	.559	.576	.594	.665	.685	.695
50-54	.478	.487	.497	.487	.528	.520	.524	.530	.538	.543	.575	.600	.610
55-59	.439	.450	.431	.432	.429	.430	.431	.443	.454	.473	.510	.535	.545
60-64	.303	.316	.321	.316	.322	.323	.325	.322	.327	.322	.345	.415	.495
65-69	.155	.138	.158	.156	.148	.151	.134	.132	.129	.130	.150	.180	.210

Table 9(a)
Adjusted T1 and T4 Reported Average Earnings, Males, Canada

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
18-19	1,339	1,665	1,775	1,835	1,856	1,943	2,216	2,705	3,296	3,580
20-24	2,923	3,501	3,659	3,929	4,110	4,320	4,593	5,176	5,997	6,626
25-29	4,741	5,206	5,574	6,057	6,428	6,878	7,372	8,066	9,112	10,110
30-34	5,796	6,209	6,713	7,347	7,877	8,318	9,075	10,024	11,327	12,576
35-39	6,354	6,820	7,349	8,086	8,692	9,025	9,877	10,925	12,358	13,751
40-44	6,582	7,107	7,667	8,426	9,000	9,344	10,222	11,352	12,854	14,310
45-49	6,579	6,964	8,184	8,331	8,938	9,206	10,089	11,237	12,821	14,323
50-54	6,254	6,772	7,183	7,879	8,425	8,714	9,560	10,718	12,319	13,782
55-59	5,993	6,307	6,724	7,363	7,899	8,049	8,829	9,888	11,355	12,758
60-64	5,569	5,681	6,112	6,532	7,020	7,005	7,616	8,534	9,828	10,994
65-69	4,452	3,838	4,372	4,513	4,658	4,786	5,299	6,016	6,954	7,068

Table 9(b)
Adjusted T1 and T4 Reported Average Earnings, Females, Canada

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
18-19	965	1,230	1,343	1,360	1,406	1,440	1,578	1,836	2,215	2,547
20-24	2,026	2,339	2,509	2,715	2,924	3,081	3,227	3,507	4,071	4,752
25-29	2,549	2,633	2,883	3,187	3,510	3,830	4,081	4,427	5,056	5,938
30-34	2,475	2,564	2,775	3,032	3,336	3,621	3,904	4,294	4,963	5,846
35-39	2,563	2,679	2,866	3,166	3,433	3,643	3,949	4,332	5,020	5,921
40-44	2,623	2,792	2,987	3,347	3,623	3,810	4,118	4,512	5,185	6,074
45-49	2,732	2,931	3,129	3,463	3,720	3,901	4,221	4,616	5,299	6,190
50-54	2,919	3,062	3,256	3,634	3,857	3,972	4,286	4,673	5,345	6,202
55-59	3,014	3,183	3,374	3,721	4,043	4,065	4,356	4,707	5,355	6,154
60-64	3,029	3,134	3,309	3,709	3,983	3,946	4,206	4,533	5,141	5,911
65-69	2,759	2,592	2,720	2,895	2,910	2,913	3,131	3,359	3,806	4,107

Table 9(c)
Adjusted T1 and T4 Reported Average Earnings, Males, Ontario

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
18-19	1,399	1,725	1,826	1,861	1,883	1,932	2,188	2,568	3,161	3,369
20-24	3,022	3,600	3,773	4,016	4,241	4,442	4,662	5,150	6,000	6,465
25-29	4,891	5,394	5,754	6,233	6,649	7,162	7,649	8,269	9,228	10,144
30-34	6,033	6,448	6,993	7,601	8,129	8,737	9,546	10,404	11,577	12,730
35-39	6,609	7,049	7,673	8,420	9,072	9,539	10,428	11,394	12,691	13,997
40-44	6,586	7,378	8,012	8,837	9,440	9,933	10,877	11,889	13,248	14,583
45-49	6,935	7,327	8,646	8,813	9,403	9,855	10,777	11,827	13,252	14,651
50-54	6,627	7,132	7,629	8,388	8,992	9,483	10,360	11,356	12,795	14,200
55-59	6,357	6,686	7,137	7,868	8,468	8,850	9,691	10,625	11,930	13,258
60-64	5,947	6,042	6,516	7,008	7,573	7,725	8,382	9,123	10,327	11,585
65-69	4,724	4,057	4,686	4,854	5,065	5,240	5,750	6,267	7,115	8,102

Table 9(d)
Adjusted T1 and T4 Reported Average Earnings, Females, Ontario

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
18-19	1,047	1,321	1,422	1,431	1,463	1,492	1,607	1,859	2,217	2,481
20-24	2,116	2,454	2,632	2,841	3,051	3,196	3,352	3,623	4,153	4,767
25-29	2,622	2,729	2,983	3,309	3,617	3,950	4,236	4,590	5,203	6,042
30-34	2,530	2,634	2,858	3,130	3,449	3,781	4,084	4,538	5,120	5,973
35-39	2,652	2,754	2,959	3,300	3,570	3,798	4,118	4,491	5,166	6,081
40-44	2,699	2,880	3,068	3,479	3,769	3,952	4,283	4,667	5,354	6,202
45-49	2,834	3,014	3,236	3,577	3,848	4,037	4,387	4,781	5,442	6,285
50-54	3,033	3,190	3,375	3,798	4,020	4,150	4,492	4,828	5,473	6,295
55-59	3,100	3,281	3,489	3,896	4,228	4,263	4,587	4,899	5,526	6,309
60-64	3,125	3,233	3,440	3,877	4,158	4,125	4,437	4,730	5,330	6,093
65-69	2,785	2,644	2,801	2,893	2,902	3,032	3,242	3,495	4,174	4,187

Contributions and Expenses of Administration

a) Contributory earnings were calculated as the product of (i) Modified Average Earnings less the Year's Basic Exemption, (ii) participation rates, and (iii) projected populations. In the past, contributions estimated in accordance with the foregoing method have always been less than contributions actually collected. However, the difference has been narrowing and by 1977 was reduced to nil. In view of this trend, no special adjustment was made to the calculation of contribution income.

b) To estimate contributions, the contribution rates assumed in the fund accumulations were applied to contributory earnings.

c) Costs of administration were assumed to be at the level of .1 per cent of contributory earnings.

Other Methodology and Assumptions Consistent With Those Adopted by the Department of Insurance

As the computer program utilized by the federal Department of Insurance was used for the CPP financial projections, it was important to examine their methodology and to review their assumptions to be satisfied they were appropriate. This analysis was undertaken and the methodology and assumptions used for determining benefits were found to be acceptable. Accordingly the methodology and assumptions given on pages 50 through 58 of the CPP Statutory Actuarial Report No. 6 as at December 31, 1977 have not been repeated here. It can be assumed however, that the manner in which the Commission approached the calculation of benefits in the following areas mirrors those used by the Department of Insurance:

- Retirement benefits
- Disability benefits
- Children of disabled contributors' benefits
- Surviving spouses' benefits
- Orphans' benefits
- Death benefits
- Modifications for division of credits on divorce.

One exception to the foregoing applies in the case of the valuation of disability benefits in payment at the end of 1975. In the case of the valuation undertaken for residents of the province of Ontario, it was determined from an analysis of the data provided that 56 per cent of the existing CPP disabled population would be allocated to that province.

A second exception applies to the "divorce and divide" provision. While this provision has some effect on the subdivision of benefits by various categories, particularly on subdivisions by sex of the contrib-

utor, it has very little effect on the aggregate level of benefits. For such purposes it might have well been ignored. In fact, for the sake of convenience, it was ignored in estimating entry age normal costs and the related unfunded liabilities referred to below.

Fund Accumulations

The Fund was assumed to be the amount to the credit of the Canada Pension Plan Account. Annual investments in provincial bonds prior to 1978 are known, but for various reasons are less in total than the amount to the credit of the Canada Pension Plan Account at December 31, 1977. They were adjusted proportionately so as to match the said credit. The annual amounts of interest earned on each year of investments made prior to 1978 are also known, and were adjusted in proportion to the adjustments in investments. Amounts invested in each future year were taken as equal to contributions for the year minus benefits for the year, plus one year's interest on outstanding investments, plus prior investments matured during the year. Each future year's investments are assumed to earn interest until maturity at the annual rate of interest on new investments as postulated in the economic assumptions for the year of investment. The Fund at the end of any year was taken as the sum of the outstanding investments.

Normally, investments are assumed to mature after 20 years. However, if the amount to be invested in any year, calculated as indicated above, and assuming 20-year maturities, should turn out to be negative, it is necessary to assume additional maturities in that year sufficient to provide a positive investment. Otherwise, there would not be sufficient funds released in that year to pay benefits. Such additional maturities were assumed to be on a last-in, first-out basis.(5)

Entry Age Normal Cost and Related Unfunded Liability

a) Entry Age Normal Cost

This was determined by estimating contributory earnings and benefits and expenses in respect of the quinary age-group cohort centred around age 18 on December 31, 1977, and determining, by an iteration process, and using the usual fund accumlation methods, the contribution rate that would be exactly sufficient to accumulate a nil fund in respect of that cohort at the expiration of all contributions and expenditures in respect of that cohort. The entry age normal cost was taken as the contribution rate so determined.

b) Unfunded Liability

The unfunded liability, assumed to be hypothetically invested in 1978, was determined by an iteration process so that together with (i) the fund at December 31, 1977, (ii) future (post-1977) contri-

butions at the entry-age-normal cost contribution rate collected in respect of the population aged 18 and over on December 31, 1977 and (iii) investment earnings, it would be just sufficient, to pay all future benefits and administrative expenses in respect of that population. The unfunded liability so calculated at December 31, 1977, was then discounted for one-half year's interest.

An accumulation process was used to determine both the entry-age-normal costs and the unfunded liability, rather than the more usual discounting process, because the interest assumptions (annual rates of interest on new investments), together with the maturity assumptions used in the Fund accumulation, are readily conducive to the accumulation of funds, but not to their discounting.(6)

FINANCIAL PROJECTIONS UNDERTAKEN

The Commission requested that a number of population and financial projections be undertaken for the CPP. Six sets of projections were requested providing a broad range of financial information for calendar years 1978 through 2050. The four population scenarios described above, (essentially variations in fertility assumptions) and the three economic scenarios previously described, formed the basis for the projections undertaken.

The table below summarizes the six projections:

Economic assumptions	Fertility assumptions			
	Low/low	Low	Most probable	High
Low			X	
Most probable	X	X	X	X
High			X	

All of the six foregoing projections were made for Canada. A seventh projection was made for Ontario, based on the most probable economic and most probable fertility assumptions and a fund based on Ontario's share of the CPP assets as of December 31, 1977.

Two additional projections were made for Canada using the most probable fertility assumptions but varying the earnings assumption $\pm$.5 per cent from the rates for 1979 and later years that were otherwise included in the most probable economic assumptions. A last set of projections was made to measure the financial implications of reintroducing the earnings test. This was also based on the most probable fertility and economic assumptions.

All nine projections developed the following information for calendar years 1978 to 2050:

a) Contributory earnings;

b) Expenditures split into retirement (including the continuation of the retirement pension to survivors), disability and survivor(7) benefits, with all three of these benefit components separated into their non-indexed and indexed portions.

c) Expenses of administration, set at one-tenth of one per cent of contributory earnings;

d) Items b) and c) expressed as a percentage of contributory earnings;

e) Net cash flow (contributions less expenditures, including expenses);

f) Investment income;

g) The accumulated fund for the various "Funds" developed.

Although not included as a part of the computer output, the fund accumulations (item g) were expressed as a multiple of the current year's benefit expenditures (item b). This payout multiple is a much more meaningful statistic since it gives a rough indication of the number of years the then fund value could cover future benefit payments under the plan, without any additional contributions to the CPP. As such it could be considered a solvency safeguard.

The splitting-out of the costs of indexing separately from the basic benefits provided by the CPP at the time of the event (death, disability, retirement), to the best of our knowledge has never been done before. The split between retirement, disability, and survivor benefits is consistent with the manner in which the Department of Insurance has presented such information in the past. In this connection it should be noted that the "retirement" category includes the pension to the contributor and the continuation, if any, of such retirement pension to survivors. The "survivors" category picks up all other pre-retirement survivor and death benefits.

Funds A, B, and C were developed for all nine projections. They can be described as follows:

	Description
Fund A	The fund accumulations that will result starting with today's fund and contributions continuing indefinitely at the current combined employee-employer rate of 3.6 per cent.
Fund B	Under this fund, contributions continue at the combined 3.6 per cent employee-employer rate up to the point where the cash flow to the provinces (contributions less expenditures) would otherwise become negative. At this point,

contributions are increased so that there is always a zero cash flow to the provinces. Under this arrangement the fund will continue to grow by the amount of interest earned on the fund and the provinces will not be required to pay interest. Instead, the interest would be capitalized each year.

Fund C — Under this fund, cash flow is permitted to become negative up to the point where the interest payments on the fund, along with the 3.6 per cent employee-employer contributions, are both required to meet the expenditures for the year. Thereafter, contributions are increased so that contributions plus fund interest will exactly cover expenditures. This leads to a constant or stable fund and a situation where the provinces will be required to pay interest on this frozen fund thereafter.

The first seven projections described (six for Canada and one for Ontario) developed, in addition to Funds A, B, and C, projections for three other funds referred to as Funds D, E, and F. These will be described later. Each of these projections required that entry age normal contribution rates and associated unfunded liabilities be developed.

The following summarizes the details of the seven projections undertaken.

1. Entry age level contributions, as a percentage of contributory earnings, were developed for the following benefits:

   a) Contributor retirement pensions, including their continuation to survivors, without indexing;

   b) Disability pensions without indexing;

   c) Survivors' pensions(7), orphans' and death benefits without indexing.

   d) Contributor retirement pensions, including their continuation to survivors, with indexing;

   e) Disability pensions with indexing;

   f) Survivors' pensions(7), orphans' and death benefits with indexing;

   g) Total of non-indexed and indexing components (see Appendix D-6).

   Expenses were not reflected in the Entry Age costs for the specific benefit items.

The objective here was to develop one entry age normal value for each of the benefit components referred to above.

2. Using a closed group valuation technique, the unfunded actuarial liability for CPP participants as of December 31, 1977 was developed.

   Five separate unfunded actuarial liabilities were developed as follows based on:

   a) Contributor retirement pensions, including their continuation to survivors, (without indexing) - item a) of paragraph 1 used as entry age level contribution;

   b) Welfare benefits - disability pensions, survivors'(7) pensions, orphans' and death benefits (without indexing) - sum of items b) and c) of paragraph 1 used as entry age level contribution;

   c) As for item a) with indexing - item d) of paragraph 1 used as entry age level contribution;

   d) As for item b) with indexing - sum of items e) and f) of paragraph 1 used as entry age level contribution;

   e) Items a) through f) plus administrative expenses - entry age level cost used is item g) of paragraph 1, plus one-tenth of one per cent.

   CPP assets as of December 31, 1977 were allocated to items a) and b) above based on a pro rata share of the present value of future benefits for each category. Assets were not allocated to items c) and d) since there was always an unfunded position created for the benefits covered by items a) and b).

   Contributions in calendar years 1979 and 1980 were allocated to items a) through d) above in proportion to related pay-go contributions in such years, both years' contributions including administrative expenses of one-tenth of one per cent.

3. Using the information generated in paragraphs 1 and 2, financial projections were developed portraying the fund build-up that would occur if entry age level funding were applied to all current and future CPP contributors (open group valuation). In addition, such contributors were assumed to pay an increased CPP contribution to cover the amortization of the December 31, 1977 unfunded liability developed for the closed group of contributors and beneficiaries as of that date (developed in paragraph 2), assuming such unfunded liability was to be amortized as a percentage of projected future covered CPP payroll over the 50-year period commencing January 1, 1980 and ending in the year 2029. The choice of 50 years for amortizing the unfunded actuarial liability was based on the knowledge

that the youngest members of the population who represent the baby boom will have reached retirement age by the year 2030.

Three sets of projections (Fund D, Fund E, and a modification to Fund E, referred to as Fund F), were undertaken to determine the relative impact of adopting entry age level contribution patterns for all or part of the CPP benefit package in lieu of pay-go funding. Details of the funding methods applied to the benefit components for each of the three fixed bases follow:

	Funding method to be used							
	Non-indexed portion				Indexed portion			
	Retirement pensions		Welfare benefits(a)		Retirement pensions		Welfare benefits(a)	
Fund basis	Entry age	Pay go	Entry age	Pay go	Entry age	Pay go	Entry age	Pay go
D	X		X		X		X	
E	X			X	X			X
F	X			X		X		X

a Includes both disability and survivor benefits.

NOTE: Where entry age contributions are noted above, the 50-year amortization payment to cover the closed group December 31, 1977 unfunded actuarial liability associated with that particular component was included as a part of the required contribution. In the instance where pay-go funding was to apply to a specific component to which assets have been allocated, such assets were first applied to reduce the pay-go costs until the fund was exhausted.

Each of the four components - Retirement (without indexing), Welfare (without indexing), Retirement(8) (indexed portion) and Welfare (indexed portion) - as well as the overall total, had separate fund accumulations developed.

4. The reintroduction of the earnings test was examined using the retirement factors specified below. These projections were developed for Funds A through F.

	Retirement factors applicable to 65-69 age group
Males	.80
Females	.90

The earnings test assumed was identical to the one initially in place at the outset of the CPP, i.e., no offset for earned income up to 18 per cent of the YMPE, $1 offset for each $2 of earned income between 18 per cent and 30 per cent of the YMPE and a $1 for $1 offset above 30 per cent. The retirement factors adopted, .80 for males and .90 for females, were established as the result of a

detailed examination of the experience available under the Quebec Pension Plan. No similar data were available for the CPP.

The level of contributory earnings to the Plan was also increased as the result of continued participation of workers in the 65-69 age group by applying the above retirement factors to the participation rates, adjusted from a zero to a YBE basis, to arrive at the number contributing. This technique led to the following approximate results for the year 2000:

	Percentage of 65-69 age group that		
	Retire	Contribute to CPP	Total(a)
		(Per cent)	
Males	80	25	105
Females	90	15	105

a Percentages exceed 100 since in the year of retirement an individual can be both a contributor and a pension recipient.

Minor changes occur in the contributor percentages for years prior to 2000.

EXTRA POPULATION ARISING FROM THE BABY BOOM

In order to measure the financial implications on the CPP of the high fertility rates during the 1945-1965 period (referred to as the "baby boom"), the Commission decided that the most meaningful technique would be to determine the extra population that resulted from the boom. This required the Commission to establish a "norm" fertility rate, above which the "extra population" would be determined.

Table 10 contains the actual total fertility rates for the period 1926-1975 along with the adjusted rates, the latter being the lesser of 3.0 (the established "norm") and the actual total fertility rate for each year. Table 11 depicts the extra population, the baby boom, pictorially. The norm of 3.0 was selected because it approximates the average total fertility rate between World Wars I and II.

The ratio of adjusted to actual total fertility ratios for each year of birth was then applied to the 1971 census population at each age (males and females separately) corresponding to the appropriate year of birth; e.g., the 1950 ratio was applied to the population age 21 from the 1971 census. The same ratios were applied to males and females, thereby retaining the ratio of male to female births at about 1.06.

The 1971 census population was adjusted before applying the ratios to eliminate the effect of immigration and emigration, since the higher birth rates of the 1945-1965 period would not be affected by either of these movements. Data for actual immigrants in each calendar year

were obtained from the Canada Year Book for each year in the period 1946-1965. The probability of death of the immigrant population was ignored, recognizing that mortality rates at ages up to 25 are extremely light in any event. Emigrants were arbitrarily set at 15 per cent of immigrants over the 21-year period. Emigrants to the United States (the only country for which such statistics are gathered) ranged from 6 per cent to 20 per cent during the same 21-year period. The number of immigrants to Canada since 1946 included in the 1971 census is shown in Table 12 distributed by quinquennial age groups. Migration from Quebec to the rest of Canada was ignored since it was felt this would not be a major contributing factor to the extra population.

The extra population resulting from the foregoing calculations is shown in Table 13. The "adjusted" 1971 population, i.e., the actual 1971 population reduced by the extra population, contained in Table 13, was then used to develop financial projections using the most probable economic and fertility assumptions for Funds A, B, and C for Canada less Quebec, and Ontario. The projections for the "adjusted" 1971 population developed the benefit outflow and contributory earnings in each calendar year along with the pay-go contribution rates, i.e., the ratio of benefit outflow to contributory earnings. The pay-go contribution rates resulting from the "adjusted" 1971 population were then compared with corresponding pay-go contribution rates resulting from projections using the actual 1971 population.

The excess of pay-go contribution rates for the actual 1971 population over the adjusted 1971 population was determined only for those years in which there was a positive result. Essentially positive excess pay-go contributions appeared in calendar years 2023 to 2037 and after the year 2045, with all other years showing negative results. The excess contribution rates were then applied to the actual 1971 population, discounted and amortized over varying periods of time ranging up to 50 years, and expressed as a percentage of contributory earnings.

Table 10
Actual and Adjusted Total Canadian Fertility Rates

	Actual TFR	Adjusted TFR
1926	3.356	3.356
1931	3.201	3.201
1936	2.695	2.695
1941	2.824	2.824
1942	2.954	2.954
1943	3.030	3.030
1944	3.000	3.000
1945	3.005	3.005
1946	3.356	3.000
1947	3.575	3.000
1948	3.423	3.000
1949	3.438	3.000
1950	3.433	3.000
1951	3.480	3.000
1952	3.621	3.000
1953	3.702	3.000
1954	3.812	3.000
1955	3.817	3.000
1956	3.849	3.000
1957	3.929	3.000
1958	3.884	3.000
1959	3.947	3.000
1960	3.910	3.000
1961	3.857	3.000
1962	3.773	3.000
1963	3.690	3.000
1964	3.521	3.000
1965	3.163	3.000
1966	2.826	2.826
1967	2.593	2.593
1968	2.445	2.445
1969	2.385	2.385
1970	2.310	2.310
1971	2.190	2.190
1972	2.024	2.024
1973	1.931	1.931
1974	1.875	1.875
1975	1.866	1.866

Table 11

TOTAL FERTILITY RATES IN CANADA

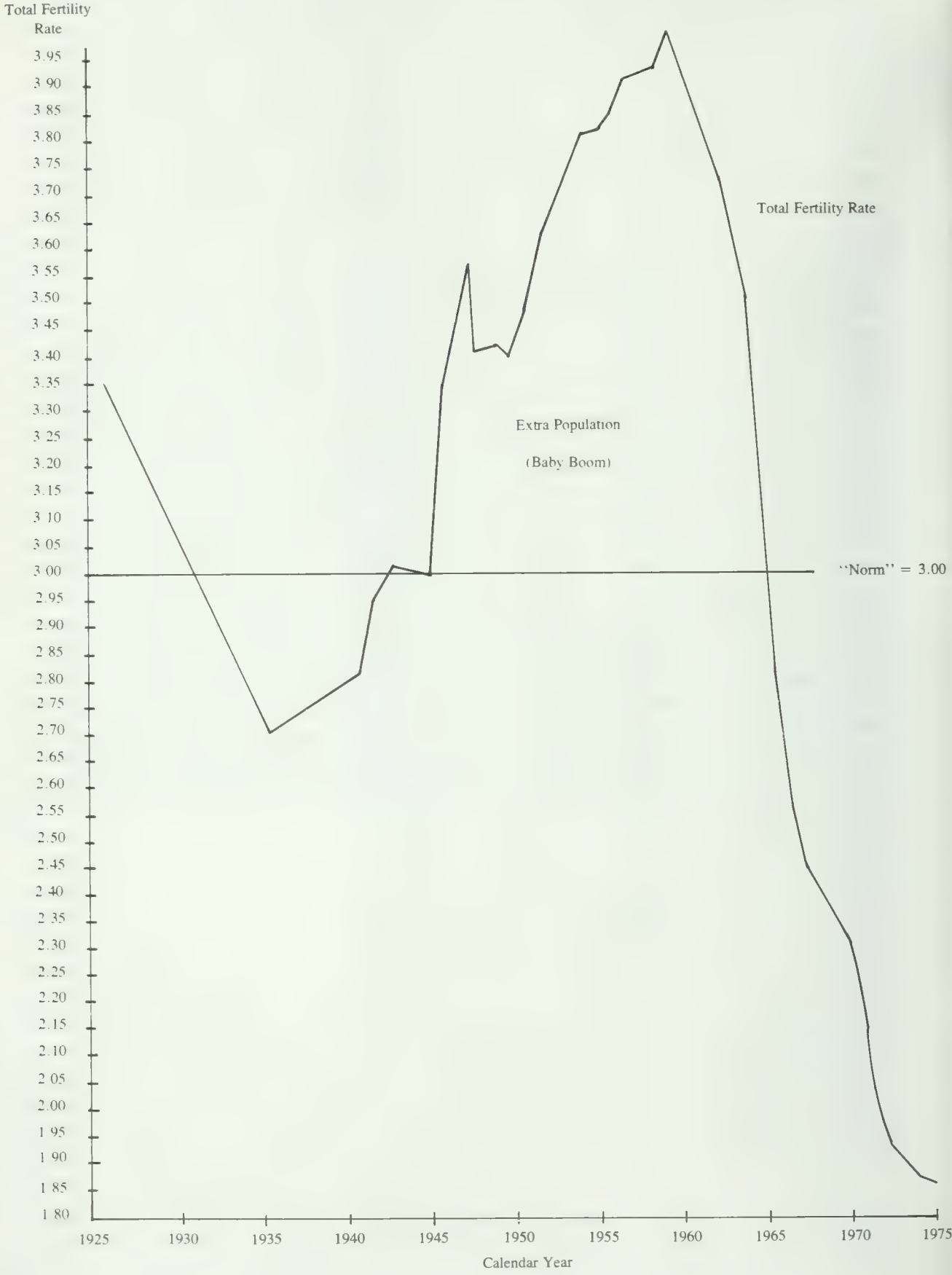


Table 12
Estimated Immigration to Canada

Year of birth	Age in 1971	Year of immigration					
		1947-51	1952-56	1957-61	1962-66	1967-71	1947-71
		(Thousands)					
1967-71	0-4					60	60
1962-66	5-9				48	62	110
1957-61	10-14			38	54	57	149
1952-56	15-19		50	42	51	61	200
1947-51	20-24	39	51	39	50	180	359
ALL	ALL	554	762	690	622	838	3,466

Table 13
Extra Population in 1971 Resulting from High Fertility in 1945-65 Period (Canada)

Age in 1971	Extra population	
	Males	Females
0-4	-	-
5	10,344	10,021
6	32,711	30,750
7	42,249	40,541
8	47,357	45,032
9	50,616	48,207
10	53,321	50,940
11	54,685	51,910
12	50,799	48,516
13	52,390	49,773
14	47,615	45,568
15	45,527	43,341
16	44,898	42,956
17	37,807	36,468
18	32,359	31,430
19	24,537	24,263
20	21,412	21,226
21	20,469	20,357
22	19,076	19,148
23	24,427	23,340
24	16,243	17,107
25+	-	-
Total	28,842	701,894

OLD AGE SECURITY AND INCOME SUPPLEMENTS

Financial projections for the federal Old Age Security (OAS) and Guaranteed Income Supplement/Spouse's Allowance (GIS/SA) programs, are based on instructions developed by the Ontario Royal Commission in co-operation with its various advisers. These projections are based entirely on the Commission's "most probable" fertility and economic assumptions, and are developed separately for all Canada, Canada less Quebec, and Ontario.

Projected OAS expenditures are set out for each region in the tables appearing in Appendix F to the report. The expenditures are expressed in terms of absolute dollars, and also as percentages of gross national or regional product (GNP) and of applicable contributory earnings under Canada/Quebec Pension Plan. In each case, three figures are shown:

1. based on a benefit level frozen at the January, 1979 rate (i.e., no pre- or post-retirement indexing);

2. based on a benefit level which increases in line with price inflation each year, but which is frozen for each recipient at the level in effect at his or her attainment of age 65 (i.e., no post-retirement indexing);

3. based on full price indexing before and after retirement.

Similar tables were developed projecting expenditures for GIS/SPA based on certain assumptions developed by Messrs. Powell and Martin of the federal Department of Health and Welfare in their paper "Economic Implications of an Aging Society in Canada" presented to the National Symposium on Aging, October 25-27, 1978. The projections include the effect of the increases in GIS and SA benefits which came into effect on January 1, 1979.

General Assumptions

All figures were derived by year-over-year adjustments to a known base, with inflation and population changes factored into all projections as follows:

Inflation

Inflation was assumed to follow the Commission's most probable economic scenario. The "non-indexed" projections of expenditures were made by taking inflation as zero. The figures for the "pre-retirement indexing only" projections were derived by an approximate adjustment to the "fully indexed" results, allowing for the inflation adjustment since retirement weighted by population in 5-year age groups.

Population

Population numbers by age group were taken from projections using the Commission's most probable fertility and other demographic assumptions.

Old Age Security Projection Method

The general approach is a modification of that used in the Powell-Martin paper, which calculated dollar OAS expenditures in future years by multiplying together

1. The projected population aged 65 and over in each year.

2. The anticipated OAS benefit level in each year.

3. An adjustment to convert population numbers to recipients.

Modifications to this basic approach have been made to allow for:

- partial OAS payments to immigrants and emigrants after June 30, 1977, based on years of residence, by an approximate adjustment to the age distribution of immigrants and emigrants in the underlying population projection;

- quarterly rather than annual adjustment of the numbers of recipients and the level of OAS benefit;

- regional distribution of the 65 and over population.

After testing the method against actual OAS payouts for Canada in fiscal years ending March 31, 1977 and 1978, it was decided to adjust for the proportion of the over-65 population actually receiving benefits by multiplying by .9923.

GIS and SA Projection Method

The 1978 calendar year was taken as the base for projection. As a first step, the anticipated total GIS payout in 1978 for Canada, Canada less Quebec, and Ontario was estimated as follows:

- the proportions of the total GIS payout in fiscal 1976-77 represented by each region were known. After adjustment for known changes in the number of recipients, these proportions were applied to the total GIS payout in fiscal 1977-78 to obtain the payout for each region in that period;

- these 1977-78 regional payouts were then extrapolated for nine months of inflation, population change, and expected reductions

in recipients and real benefits, to obtain the estimated payouts by region for calendar 1978.

Next, an adjustment was made to this 1978 base to recognize the increased benefits that will result from the $20 per month per household increase and improved spouse's allowance benefits effective January 1, 1979. The total additional payment in fiscal 1979-80 for this amendment was estimated at $290 million for Canada as a whole in a Department of Health and Welfare press release dated October 17, 1978. The provincial components also given in the release were used to adjust the 1978 base after appropriate reduction for population and inflation changes.

The resulting notional 1978 base of total GIS payout in $ millions was:

	Canada	Canada less Quebec	Ontario
Before adjustment for 1/1/79 changes	1,132	800	330
Adjustment for 1/1/79 changes	235	168	72

SA benefits were included by adding 11 per cent to the GIS payouts. The GIS plus SA payouts in subsequent years were then developed by multiplicative adjustments to the 1978 base for:

1. Inflation.

2. Changes in the total population in each region aged 65 and over.

3. Reduction in the proportion of GIS recipients in the 65 and over population.

4. Reductions in the average real benefit payout.

Assumptions for GIS/SA Projection

The proportion of the population aged 65 and over which is receiving GIS benefits was assumed to reduce each year by the following alternative sets of percentages, compounded:

	Powell and Martin	Royal Commission
	(Per cent)	
Until 1991	1.6	1.0
1992 and later years	.0	.5

Real Benefit Amount

The average benefit per recipient was assumed to reduce in real terms by the following alternative sets of percentages, compounded:

	Powell and Martin	Royal Commission
Until 1991	1.4	.5
1992 and later years	1.0	.0

Gross National or Regional Product (GNP)

GNP for Canada was available up to and including the third quarter of 1978. Gross provincial products for Ontario and Quebec were available up to and including calendar 1977. These were then expressed as percentages of the national level per head of the working population taken as the projected male plus female population aged 18 to 64 inclusive. The calendar 1978 base for each region was then derived by adjusting for population change and inflation. This base was then projected into the future by including increases for:

- inflation as under the Commission's most probable economic scenario;

- a real growth rate of 2 per cent per annum, compounded;

- growth in the working population.

Contributory Earnings Under CPP and QPP

CPP earnings were taken from the projection based on the Commission's most probable economic and demographic assumptions. QPP earnings were supplied by the Quebec Pension Board based on assumptions in the December 31, 1974 report adjusted for the change in the retirement/earnings test. The QPP assumptions are reasonably similar to those used by the Commission.

NOTES

(1) For details see Department of Insurance, Ottawa, Canada Pension Plan Actuarial Report No. 6, as at December 31, 1977, p. 40. This report is referred to in the text as "Statutory Actuarial Report No. 6."

(2) Ibid., p. 38.

(3) Long-term price, wage, and nominal interest rate forecasts must be consistent. The fact that higher inflation rates are associated with higher nominal interest rates is perfectly rational, and is explained by both borrowers and lenders of funds accepting that their loan contract must be ultimately validated in terms of real purchasing power. In a similar fashion, money wage changes, and price level changes are linking to maintain real purchasing power.

(4) Compare the approach taken in Statutory Actuarial Report No. 6, p. 48.

(5) This section on Fund Accumulation is taken from Statutory Actuarial Report No. 6, p. 58.

(6) This section was taken from Statutory Actuarial Report No. 6, pp. 58 and 59.

(7) This includes all survivors' pensions except those payable to survivors of those actually retired.

(8) Includes continuation to survivors.

Selected Tables from the Royal Commission's Projections

Appendix A	-	Population Projections	242
Appendix B	-	Dependency Ratios	250
Appendix C	-	Canada Pension Plan Projected Contributions and Expenditures	255
Appendix D	-	Canada Pension Plan Fund Analysis	272
Appendix E	-	Comparison of Royal Commission projections with Statutory Actuarial Report No. 6 on the Canada Pension Plan as at December 31, 1977	297
Appendix F	-	Old Age Security, Guaranteed Income Supplement and Spouse's Allowance Projected Expenditures	303
Appendix G	-	Selected Canada Pension Plan Projections, Canada less Quebec, based on high economic and low/low fertility assumptions.	310

APPENDIX A - POPULATION PROJECTIONS

(All based on the Royal Commission's most probable fertility and immigration assumptions.)

Appendix	A-1	Population, Canada, 1970-2050, Males	243
	A-2	Population, Canada, 1970-2050, Females	244
	A-3	Population, Canada Less Quebec, 1970-2050, Males	245
	A-4	Population, Canada Less Quebec, 1970-2050, Females	246
	A-5	Population, Ontario, 1970-2050, Males	247
	A-6	Population, Ontario, 1970-2050, Females	248
	A-7	Total population Canada, Canada Less Quebec, Ontario 1970-2050, Males and Females Combined	249

Projected Male Population, by Age Group, Canada, as of July 1, 1970-2050 Appendix A-1

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
								(Thousands)									
0- 4	978	914	1094	1353	1389	1213	1127	1198	1316	1373	1347	1311	1322	1374	1421	1437	1436
5- 9	1182	991	925	1102	1361	1397	1222	1137	1207	1325	1382	1356	1320	1332	1383	1430	1446
10-14	1178	1210	1000	932	1109	1367	1404	1229	1144	1214	1332	1389	1363	1327	1339	1391	1437
15-19	1077	1196	1215	1005	937	1114	1371	1408	1233	1149	1219	1336	1393	1367	1331	1343	1394
0-19	4415	4311	4234	4392	4796	5091	5124	4972	4900	5061	5280	5392	5398	5400	5474	5601	5713
20-24	957	1108	1214	1231	1023	957	1132	1388	1424	1251	1168	1237	1353	1409	1384	1348	1360
25-29	790	1013	1142	1241	1259	1054	989	1164	1417	1453	1282	1199	1267	1382	1438	1412	1377
30-34	667	839	1036	1158	1258	1276	1073	1009	1182	1433	1469	1299	1217	1284	1399	1454	1429
35-39	662	687	847	1038	1160	1259	1278	1077	1014	1185	1434	1470	1301	1220	1287	1400	1455
40-44	654	666	687	842	1031	1152	1250	1268	1070	1008	1178	1424	1459	1292	1212	1279	1391
45-49	614	643	656	675	828	1013	1132	1228	1247	1053	992	1159	1401	1436	1273	1195	1261
50-54	523	600	623	636	654	802	982	1098	1192	1210	1023	965	1128	1363	1397	1239	1164
55-59	473	489	569	590	603	621	763	934	1045	1135	1154	976	922	1078	1304	1337	1188
60-64	376	436	449	522	542	555	573	704	863	967	1051	1069	906	857	1005	1216	1248
20-64	5716	6481	7223	7933	8358	8689	9172	9870	10454	10695	10751	10798	10954	11321	11699	11880	11873
65-69	288	329	380	392	457	477	488	506	624	766	861	937	956	812	770	905	1098
70-74	205	236	266	309	320	374	392	403	420	519	640	722	788	806	687	654	773
75-79	143	148	172	194	227	236	277	292	301	316	393	486	550	603	619	529	506
80-84	86	87	92	107	122	144	151	178	188	195	206	259	321	367	403	416	357
85-89	39	42	42	46	54	62	74	79	94	101	105	113	143	180	207	230	239
90+	13	16	18	19	20	24	29	36	40	48	53	58	64	80	103	124	143
65-90+	774	858	970	1067	1200	1317	1411	1494	1667	1945	2258	2575	2822	2848	2789	2858	3116
Total	10905	11650	12427	13392	14354	15097	15707	16336	17021	17701	18289	18765	19174	19569	19962	20339	20702

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Female Population, by Age Group, Canada, as of July 1, 1970-2050 Appendix A-2

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0- 4	939	868	1037	1282	1317	1149	1068	1134	1246	1300	1275	1241	1251	1300	1344	1360	1359
5- 9	1127	952	879	1044	1290	1324	1157	1077	1143	1255	1309	1284	1249	1261	1309	1353	1369
10-14	1128	1154	961	886	1051	1297	1331	1165	1084	1151	1262	1316	1291	1257	1268	1317	1361
15-19	1041	1144	1162	968	893	1059	1304	1339	1173	1092	1158	1270	1324	1299	1265	1276	1324
0-19	4235	4118	4039	4180	4551	4829	4860	4715	4646	4798	5004	5111	5115	5117	5186	5306	5413
20-24	947	1086	1169	1183	991	917	1083	1328	1363	1197	1117	1183	1294	1348	1323	1289	1300
25-29	762	1006	1121	1198	1213	1022	950	1116	1360	1394	1229	1149	1215	1326	1380	1356	1322
30-34	639	803	1027	1137	1215	1230	1041	969	1134	1377	1412	1248	1168	1234	1345	1398	1374
35-39	626	654	813	1033	1143	1220	1236	1048	976	1141	1383	1418	1254	1175	1241	1351	1405
40-44	634	632	657	812	1031	1140	1217	1234	1047	976	1140	1381	1416	1253	1175	1240	1350
45-49	621	630	629	653	806	1023	1132	1208	1225	1040	970	1133	1371	1406	1245	1168	1233
50-54	529	619	622	620	644	796	1009	1116	1192	1208	1027	959	1119	1355	1389	1231	1156
55-59	474	512	606	608	607	630	779	987	1092	1166	1183	1006	940	1098	1329	1362	1208
60-64	386	463	495	584	586	586	609	752	953	1054	1126	1143	974	911	1064	1288	1321
20-64	5618	6405	7139	7828	8236	8564	9056	9758	10342	10553	10587	10620	10751	11106	11491	11683	11669
65-69	316	366	435	465	549	553	553	577	713	904	1002	1072	1089	929	870	1018	1233
70-74	248	284	328	391	419	496	501	502	525	651	827	919	985	1003	857	805	945
75-79	185	206	236	274	328	353	419	424	427	448	558	710	792	851	868	744	701
80-84	116	132	152	175	204	247	267	319	325	329	348	437	559	627	677	694	598
85-89	56	69	79	92	108	127	156	171	206	212	218	233	296	383	434	472	489
90+	22	29	37	44	52	63	77	96	110	134	147	155	169	212	276	332	376
65-90+	943	1086	1267	1441	1660	1839	1973	2089	2306	2678	3100	3526	3890	4005	3982	4065	4342
Total	10796	11609	12445	13449	14447	15232	15889	16562	17294	18029	18691	19257	19756	20228	20659	21054	21424

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Male Population, by Age Group, Canada Less Quebec, as of July 1, 1970-2050 Appendix A-3

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0- 4	714	692	820	1001	1029	915	869	930	1015	1052	1036	1021	1041	1084	1118	1131	1137
5- 9	845	732	708	833	1013	1041	926	880	941	1025	1063	1047	1032	1052	1095	1129	1142
10-14	834	875	745	719	843	1023	1049	935	889	950	1034	1071	1056	1041	1061	1104	1138
15-19	758	853	884	753	727	850	1028	1055	940	895	956	1039	1076	1061	1046	1066	1109
0-19	3151	3152	3157	3306	3612	3829	3872	3800	3785	3922	4089	4178	4205	4238	4320	4430	4526
20-24	673	792	873	902	772	746	868	1045	1071	958	913	973	1056	1093	1077	1062	1083
25-29	550	734	827	903	932	803	777	899	1074	1100	987	943	1002	1084	1120	1105	1090
30-34	474	602	761	849	924	952	823	798	918	1092	1118	1006	962	1021	1102	1138	1123
35-39	474	500	616	770	857	931	958	830	805	924	1097	1122	1012	968	1026	1107	1143
40-44	472	485	505	617	769	855	927	953	828	803	921	1091	1116	1008	964	1022	1102
45-49	446	469	482	500	610	758	842	913	939	816	792	908	1076	1101	994	952	1009
50-54	383	441	457	469	487	593	737	818	887	913	794	771	885	1048	1072	969	929
55-59	349	362	421	435	447	464	565	702	780	847	872	759	738	847	1003	1027	929
60-64	278	325	334	388	402	413	429	523	650	723	785	809	705	687	790	936	959
20-64	4099	4710	5276	5833	6200	6515	6926	7481	7952	8176	8279	8382	8552	8857	9148	9318	9367
65-69	217	245	285	294	341	355	365	380	465	579	645	702	724	633	617	712	846
70-74	156	179	199	233	241	281	293	302	316	388	484	542	591	612	536	524	607
75-79	111	113	131	147	172	179	209	219	227	239	294	368	414	453	470	413	406
80-84	69	69	71	83	93	110	115	135	142	148	157	195	245	276	303	316	279
85-89	32	35	34	36	42	48	58	61	72	77	80	86	108	137	157	173	182
90+	11	14	15	15	17	20	23	28	31	37	41	45	49	61	79	94	108
65-90+	596	655	735	808	906	993	1063	1125	1253	1468	1701	1938	2131	2172	2162	2232	2428
Total	7846	8517	9168	9947	10718	11337	11861	12406	12990	13566	14069	14498	14888	15267	15630	15980	16321

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Female Population, by Age Group, Canada Less Quebec, as of July 1, 1970-2050 Appendix A-4

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0- 4	685	658	778	950	976	868	824	882	962	997	982	967	986	1027	1059	1071	1076
5- 9	806	703	674	791	962	988	878	835	892	972	1007	992	978	997	1038	1070	1082
10-14	796	834	716	684	801	971	996	887	843	901	981	1016	1001	987	1006	1046	1079
15-19	733	816	845	725	694	810	979	1004	895	852	909	989	1024	1009	995	1014	1055
0-19	3020	3011	3013	3150	3433	3637	3677	3608	3592	3722	3879	3964	3989	4020	4098	4201	4292
20-24	664	778	844	871	751	719	834	1003	1028	920	876	934	1013	1048	1033	1019	1038
25-29	527	727	817	878	904	784	752	866	1035	1060	952	908	966	1045	1080	1065	1051
30-34	451	572	752	838	898	924	803	771	885	1054	1078	970	927	985	1064	1099	1084
35-39	441	472	585	762	847	907	932	812	780	894	1061	1086	979	936	993	1072	1107
40-44	451	452	478	589	764	849	908	932	813	782	895	1062	1086	980	938	994	1073
45-49	450	452	453	478	587	761	844	902	927	809	778	890	1056	1081	975	934	990
50-54	385	453	449	449	473	581	752	834	891	916	801	770	881	1044	1069	965	925
55-59	345	375	445	441	441	465	570	736	817	873	897	785	756	865	1025	1049	948
60-64	280	340	364	431	427	427	451	552	712	790	845	869	761	733	839	994	1018
20-64	3994	4621	5187	5737	6092	6417	6846	7408	7888	8098	8183	8274	8425	8717	9016	9191	9234
65-69	232	267	321	344	407	404	405	428	524	677	752	805	828	727	701	803	953
70-74	186	209	240	289	311	368	367	369	390	480	620	690	740	763	671	649	745
75-79	142	157	175	202	244	263	313	312	314	334	412	534	596	640	662	583	565
80-84	91	104	117	131	153	186	201	240	241	244	261	324	422	473	510	530	469
85-89	45	56	63	72	82	96	119	130	156	159	162	176	221	290	328	357	373
90 +	18	24	30	36	42	49	59	74	85	102	111	117	128	158	209	251	284
65-90 +	714	817	946	1074	1239	1366	1464	1553	1710	1996	2318	2646	2935	3051	3081	3173	3389
Total	7728	8449	9146	9961	10764	11420	11987	12569	13190	13816	14380	14884	15349	15788	16195	16565	16915

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Male Population, by Age Group, Ontario, as of July 1, 1970-2050

Appendix A-5

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0- 4	341	335	396	485	500	444	421	451	494	516	510	503	512	534	554	563	566
5- 9	407	352	342	402	490	506	450	427	457	500	522	517	509	518	541	560	569
10-14	399	425	358	346	406	495	510	455	432	462	505	527	522	514	523	546	565
15-19	361	410	429	361	350	410	498	514	459	436	466	509	531	525	517	527	549
0-19	1508	1522	1525	1594	1746	1855	1879	1847	1842	1914	2003	2056	2074	2091	2135	2196	2249
20-24	333	386	421	439	372	362	421	509	524	470	447	477	519	541	535	528	537
25-29	280	374	404	437	455	390	380	439	526	541	487	465	494	536	558	552	545
30-34	243	310	387	415	448	466	402	392	451	537	552	499	477	505	547	569	563
35-39	245	258	316	391	419	452	470	406	397	455	541	555	502	480	509	551	572
40-44	246	251	259	316	390	418	450	468	405	396	454	539	553	501	479	507	549
45-49	230	245	248	256	311	384	411	443	462	400	391	448	531	545	494	473	501
50-54	188	228	238	241	249	302	373	400	431	449	389	381	436	517	531	482	462
55-59	170	177	217	226	229	237	288	355	381	411	428	372	364	418	495	509	462
60-64	134	158	163	199	208	211	219	266	328	353	381	397	346	339	389	462	475
20-64	2069	2387	2653	2920	3081	3222	3414	3678	3905	4012	4070	4133	4222	4382	4537	4633	4666
65-69	104	117	138	142	175	183	186	193	236	292	314	340	355	310	305	351	418
70-74	74	85	95	112	116	143	150	154	160	196	244	263	286	300	262	259	300
75-79	49	53	62	69	82	86	106	112	115	120	149	185	201	219	230	202	200
80-84	28	30	33	39	44	52	55	68	72	74	79	98	122	134	146	155	136
85-89	13	14	15	16	19	22	27	29	36	39	40	43	54	68	75	83	89
90 +	4	5	6	6	7	9	10	13	14	18	20	22	24	30	39	46	52
65-90 +	272	304	349	384	443	495	534	569	633	739	846	951	1042	1061	1057	1096	1195
Total	3849	4213	4527	4898	5270	5572	5827	6094	6380	6665	6919	7140	7338	7534	7729	7925	8110

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Female Population, by Age Group, Ontario, as of July 1, 1970-2050 Appendix A-6

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0- 4	326	319	376	460	474	421	399	427	468	489	484	476	485	506	525	533	536
5- 9	387	337	325	381	465	480	427	405	433	474	495	490	482	491	512	531	539
10-14	380	404	342	330	386	470	484	432	410	438	479	500	495	487	496	517	536
15-19	351	391	409	347	334	390	474	489	436	415	443	484	505	499	492	501	522
0-19	1444	1451	1452	1518	1659	1761	1784	1753	1747	1816	1901	1950	1967	1983	2025	2082	2133
20-24	333	379	405	421	360	348	404	488	503	450	429	457	498	519	513	506	515
25-29	271	373	399	422	439	378	366	423	507	521	469	448	475	516	537	532	524
30-34	233	296	385	409	432	449	389	378	434	517	532	480	459	486	527	548	543
35-39	231	246	302	390	413	437	454	394	383	439	522	537	485	464	491	532	553
40-44	237	237	248	303	390	414	437	454	395	384	440	523	537	486	465	493	533
45-49	233	238	237	247	302	388	412	435	452	393	383	438	520	534	484	463	491
50-54	189	235	236	234	245	298	384	407	430	447	389	379	433	515	529	479	459
55-59	170	184	231	231	230	240	293	376	399	422	438	382	372	426	505	519	471
60-64	141	168	179	223	223	222	233	283	364	386	408	424	370	361	413	490	504
20-64	2038	2356	2622	2880	3034	3174	3372	3638	3867	3959	4010	4068	4149	4307	4464	4562	4593
65-69	119	135	158	169	210	211	211	221	269	345	367	388	404	354	346	396	470
70-74	96	107	120	142	152	190	191	191	201	246	316	336	357	372	327	320	367
75-79	71	80	89	101	119	128	160	162	162	171	211	271	290	308	323	284	278
80-84	45	51	59	66	75	89	97	122	124	125	133	165	214	229	245	258	228
85-89	22	27	31	36	41	47	57	62	79	81	83	89	112	146	159	171	182
90 +	9	12	14	17	20	24	28	35	40	51	56	59	65	80	105	123	137
65-90 +	362	412	471	531	617	689	744	793	875	1019	1166	1308	1442	1489	1505	1552	1662
Total	3844	4219	4545	4929	5310	5624	5900	6184	6489	6794	7077	7326	7558	7779	7994	8196	8388

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Total Population, Males and Females Combined, by Age Group, Canada, Canada Less Quebec, Ontario, as of July 1, 1970-2050

Appendix A-7

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
Canada																	
0-19	8650	8429	8273	8572	9347	9920	9984	9687	9546	9859	10284	10503	10513	10517	10660	10907	11126
20-64	11334	12886	14362	15761	16594	17253	18228	19628	20796	21248	21338	21418	21705	22427	23190	23563	23542
65-90+	1717	1944	2237	2508	2860	3156	3384	3583	3973	4623	5358	6101	6712	6853	6771	6923	7458
Total	21701	23259	24872	26841	28801	30329	31596	32898	34315	35730	36980	38022	38930	39797	40621	41393	42126
Canada less Quebec																	
0-19	6171	6163	6170	6456	7045	7466	7549	7408	7377	7644	7968	8142	8194	8258	8418	8631	8818
20-64	8093	9331	10463	11570	12292	12932	13772	14889	15840	16274	16462	16656	16977	17574	18164	18509	18601
65-90+	1310	1472	1681	1882	2145	2359	2527	2678	2963	3464	4019	4584	5066	5223	5243	5405	5817
Total	15574	16966	18314	19908	21482	22757	23848	24975	26180	27382	28449	29382	30237	31055	31825	32545	33236
Ontario																	
0-19	2952	2973	2977	3112	3405	3616	3663	3600	3589	3730	3904	4006	4041	4074	4160	4278	4382
20-64	4107	4743	5275	5800	6115	6396	6786	7316	7772	7971	8080	8201	8371	8689	9001	9195	9259
65-90+	634	716	720	915	1060	1184	1278	1362	1508	1758	2012	2259	2484	2550	2562	2648	2857
Total	7693	8432	8972	9827	10580	11196	11727	12278	12869	13459	13996	14466	14896	15313	15723	16121	16498

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

APPENDIX B - DEPENDENCY RATIOS

(Unless otherwise stated ratios use the Royal Commission's population projections based on its most probable fertility and immigration assumptions)

Appendix B-1	Dependency Ratios, Canada, 1975-2050	252
B-2	Dependency Ratios, Canada Less Quebec, 1975-2050	252
B-3	Dependency Ratios, Ontario, 1975-2050	253
B-4	Dependency Ratios, Canada Less Quebec, Four Fertility Assumptions, Males and Females Combined, Comparison of ages 65 + to ages 20-64 and ages 0-19 to ages 20-64	254

Dependency Ratios, Canada, 1975-2050 Appendix B-1

	Ages 65+ to Ages 20-64			Ages 0-19 to Ages 20-64		
	Males	Females	Combined	Males	Females	Combined
			(Per cent)			
1975	13.2	17.0	15.1	66.5	64.3	65.4
1980	13.4	17.7	15.6	58.6	56.6	57.6
1990	14.4	20.2	17.2	57.4	55.3	56.3
2000	15.4	21.8	18.5	55.9	53.7	54.8
2010	15.9	22.3	19.1	46.9	44.9	45.9
2020	21.0	29.3	25.1	49.1	47.3	48.2
2030	25.8	36.2	30.9	49.3	47.6	48.4
2040	23.8	34.7	29.2	46.8	45.1	46.0
2050	26.2	37.2	31.7	48.1	46.4	47.3

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's population projections, based on its most probable fertility and immigration assumptions.

Dependency Ratios, Canada Less Quebec, 1975-2050

Appendix B-2

	Ages 65+ to Ages 20-64			Ages 0-19 to Ages 20-64		
	Males	Females	Combined	Males	Females	Combined
			(Per cent)			
1975	13.9	17.7	15.8	66.9	65.1	66.0
1980	13.9	18.2	16.1	59.8	58.1	59.0
1990	14.6	20.3	17.5	58.2	56.4	57.3
2000	15.3	21.4	18.3	54.9	53.7	54.8
2010	15.8	21.7	18.7	47.6	45.5	46.6
2020	20.5	28.3	24.4	49.4	47.4	48.4
2030	24.9	34.8	29.8	49.2	47.3	48.2
2040	23.6	34.2	28.9	47.2	45.5	46.3
2050	25.9	36.7	31.3	48.3	46.5	47.4

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's population projections, based on its most probable fertility and immigration assumptions.

	Ages 65+ to Ages 20-64			Ages 0-19 to Ages 20-64		
	Males	Females	Combined	Males	Females	Combined
			(Per cent)			
1975	12.7	17.5	15.1	63.8	61.6	62.7
1980	13.2	18.0	15.5	57.5	55.4	56.4
1990	14.4	20.3	17.3	56.7	54.7	55.7
2000	15.6	22.1	18.8	55.0	52.9	54.0
2010	16.2	22.6	19.4	47.2	45.2	46.2
2020	20.8	29.1	24.9	49.2	47.4	48.3
2030	24.7	34.8	29.7	49.1	47.4	48.3
2040	23.3	33.9	28.5	46.6	45.4	46.2
2050	25.6	36.2	30.9	48.2	46.4	47.3

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's population projections, based on its most probable fertility and immigration assumptions.

Dependency Ratios, Various Fertility Assumptions, Canada Less Quebec, 1975-2050 Appendix B-4

	Ages 65+ to Ages 20-64				Ages 0-19 to Ages 20-64			
	Low/low	Low	Most probable	High	Low/low	Low	Most probable	High
				(Per cent)				
1975	15.8	15.8	15.8	15.8	66.0	66.0	66.0	66.0
1980	16.1	16.1	16.1	16.1	57.5	58.0	59.0	60.2
1990	17.5	17.5	17.5	17.5	49.3	52.2	57.3	64.2
2000	18.6	18.5	18.3	18.2	45.9	50.5	54.8	62.9
2010	19.7	19.5	18.7	17.8	41.4	45.9	46.6	49.3
2020	26.7	25.5	24.4	22.6	41.5	46.8	48.4	50.2
2030	34.2	31.7	29.8	27.2	42.2	47.9	48.2	49.5
2040	34.6	31.0	28.9	25.8	41.6	46.8	46.3	45.9
2050	35.5	31.7	31.3	29.8	41.8	47.2	47.4	47.3

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's four fertility assumptions for population projections.

APPENDIX C - CANADA PENSION PLAN PROJECTED CONTRIBUTIONS AND EXPENDITURES

(Unless otherwise stated all tables are for Canada less Quebec and are based on the Royal Commission's most probable fertility and economic assumptions.)

Appendix C-1	Expenditures as a Percentage of Contributory Earnings, Selected Years, 1978 to 2050	257
C-2	Comparison of Expenditures as a Percentage of Contributory Earnings, Selected Years, 1978 to 2050, Various Fertility and Economic Assumptions	258
C-3	Relationship of Expenditures as a Percentage of Contributory Earnings for Various Economic and Fertility assumptions to Most Probable Economic and Fertility Assumptions	259
C-4	Expenditures as a Percentage of Contributory Earnings with breakout for Retirement Benefits, Disability Benefits, and Survivor Benefits, with and without Indexing, Annually, 1978 to 2050	260
C-5	Contributory Earnings and Expenditures in Millions of Dollars, Selected Years, 1978 to 2050	263
C-6	Contributory Earnings and Expenditures in Millions of Dollars, Annually, 1978 to 2050	264
C-7	Comparison of Expenditures in Millions of Dollars and as a Percentage of Contributory Earnings Based on Most Probable Fertility and Most Probable and High Economic Assumptions	267

C-8 Comparison of Expenditures in Millions of Dollars and as a Percentage of Contributory Earnings Based on Most Probable Economic and Most Probable and Low/Low Fertility Assumptions, Selected Years 268

C-9 Comparison of Population, Projected Expenditures, Fund Size, Unfunded Actuarial Liability, and Pay-go Contributions, between Canada Less Quebec, and Ontario, 1975-2050 269

C-10 Comparison of Entry Age Normal Costs and Allocation of Initial Assets, between Canada Less Quebec, and Ontario 270

C-11 Comparison of Unfunded Liabilities and 50-Year Liquidation Percentage between Canada Less Quebec, and Ontario, Based on Canadian and Ontario Investment Rates of Return 271

Canada Pension Plan Expenditures as a Percentage of Contributory Earnings, Canada Less Quebec, 1978-2050 Appendix C-1

	Retirement		Disability		Survivors			Total		
	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Non-indexed benefit(a)	Indexing cost	Grand total
					(Per cent)					
1978	1.21	.17	.29	.02	.52	.05	.10	2.12	.24	2.36
1980	1.44	.28	.29	.05	.59	.11	.10	2.42	.44	2.86
1990	2.27	.74	.32	.12	.70	.37	.10	3.39	1.23	4.61
2000	2.85	.99	.34	.13	.80	.51	.10	4.10	1.63	5.73
2010	3.21	1.11	.38	.15	.81	.58	.10	4.50	1.84	6.34
2020	4.43	1.47	.39	.15	.89	.66	.10	5.81	2.28	8.08
2030	5.16	1.89	.34	.13	.94	.72	.10	6.54	2.75	9.28
2040	4.63	1.99	.37	.12	.92	.74	.10	6.03	2.85	8.87
2050	5.19	2.01	.38	.12	.92	.73	.10	6.59	2.87	9.45

a Includes expenses.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan Expenditures as a Percentage of Contributory Earnings, Various Economic and Fertility Assumptions, Canada Less Quebec, 1978-2050

Appendix C-2

Assumptions						
Economic:	Most probable				Low	High
Fertility:	Most probable	Low/Low	Low	High	Most probable	Most probable
	(Per cent)					
1978	2.36	2.36	2.36	2.36	2.34	2.37
1980	2.86	2.86	2.86	2.86	2.85	2.89
1990	4.61	4.60	4.60	4.62	4.68	4.34
2000	5.73	5.82	5.79	5.65	5.78	5.59
2010	6.34	6.79	6.62	5.99	6.38	6.26
2020	8.08	8.87	8.45	7.48	8.11	8.02
2030	9.28	10.63	9.82	8.49	9.32	9.21
2040	8.87	10.50	9.42	8.06	8.92	8.79
2050	9.45	10.60	9.50	9.13	9.52	9.34

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Relationship of Canada Pension Plan Expenditures as a Percentage of Contributory Earnings for Various Economic and Fertility Assumptions to Most Probable Economic and Fertility Assumptions, Canada Less Quebec, 1978-2050

Appendix C-3

	Assumptions				
	Economic:	Most probable		Low	High
	Fertility:	Low/Low	Low	High	Most probable	Most probable
1978		1.000	1.000	1.000	.992	1.004
1980		1.000	1.000	1.000	.997	1.010
1990		.998	.998	1.002	1.015	.941
2000		1.016	1.010	.986	1.009	.976
2010		1.071	1.044	.945	1.006	.987
2020		1.098	1.046	.926	1.004	.993
2030		1.145	1.058	.915	1.004	.992
2040		1.184	1.062	.909	1.006	.991
2050		1.122	1.005	.966	1.007	.988

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan Expenditures as A Percentage of Contributory Earnings, Canada Less Quebec, 1978-2050

	Retirement		Disability		Survivors			
	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Total expenditures
				(Per cent)				
1978	1.21	.17	.29	.02	.52	.05	.10	2.36
1979	1.34	.23	.29	.04	.55	.08	.10	2.62
1980	1.44	.28	.29	.05	.59	.11	.10	2.86
1981	1.48	.33	.29	.06	.61	.14	.10	3.01
1982	1.52	.37	.29	.07	.64	.17	.10	3.16
1983	1.56	.42	.29	.08	.64	.19	.10	3.28
1984	1.62	.46	.30	.08	.63	.22	.10	3.41
1985	1.69	.51	.30	.09	.64	.24	.10	3.56
1986	1.80	.56	.31	.10	.65	.27	.10	3.78
1987	1.92	.61	.31	.10	.66	.29	.10	3.99
1988	2.04	.66	.31	.11	.67	.32	.10	4.21
1989	2.16	.70	.32	.11	.69	.34	.10	4.42
1990	2.27	.74	.32	.12	.70	.37	.10	4.61
1991	2.37	.78	.32	.12	.71	.38	.10	4.78
1992	2.47	.81	.33	.12	.72	.40	.10	4.94
1993	2.55	.84	.33	.12	.73	.42	.10	5.09
1994	2.63	.86	.33	.12	.75	.43	.10	5.22
1995	2.69	.89	.33	.13	.76	.45	.10	5.34
1996	2.74	.91	.33	.13	.77	.46	.10	5.44
1997	2.77	.93	.33	.13	.78	.48	.10	5.53
1998	2.80	.95	.33	.13	.79	.49	.10	5.60
1999	2.83	.97	.34	.13	.80	.50	.10	5.67
2000	2.85	.99	.34	.13	.80	.51	.10	5.73

	Retirement		Disability		Survivors			
	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Total expenditures
				(Per cent)				
2001	2.85	1.00	.34	.13	.80	.52	.10	5.75
2002	2.85	1.01	.34	.14	.80	.53	.10	5.78
2003	2.86	1.02	.35	.14	.80	.54	.10	5.81
2004	2.88	1.03	.35	.14	.80	.54	.10	5.85
2005	2.91	1.04	.36	.14	.80	.55	.10	5.90
2006	2.94	1.05	.36	.14	.80	.56	.10	5.96
2007	2.99	1.06	.37	.14	.80	.56	.10	6.03
2008	3.05	1.08	.37	.15	.81	.57	.10	6.11
2009	3.12	1.09	.37	.15	.81	.58	.10	6.22
2010	3.21	1.11	.38	.15	.81	.58	.10	6.34
2011	3.32	1.13	.38	.15	.82	.59	.10	6.49
2012	3.44	1.16	.38	.15	.83	.60	.10	6.65
2013	3.57	1.19	.38	.15	.83	.60	.10	6.82
2014	3.69	1.22	.38	.15	.84	.61	.10	7.00
2015	3.82	1.25	.38	.15	.85	.62	.10	7.18
2016	3.95	1.29	.39	.15	.86	.63	.10	7.36
2017	4.08	1.33	.39	.15	.87	.63	.10	7.55
2018	4.20	1.38	.39	.15	.87	.64	.10	7.73
2019	4.32	1.42	.39	.15	.88	.65	.10	7.90
2020	4.43	1.47	.39	.15	.89	.66	.10	8.08
2021	4.54	1.51	.38	.15	.90	.66	.10	8.25
2022	4.65	1.56	.38	.14	.91	.67	.10	8.41
2023	4.75	1.61	.38	.14	.91	.68	.10	8.56
2024	4.83	1.65	.37	.14	.92	.68	.10	8.70
2025	4.91	1.70	.37	.14	.92	.69	.10	8.83

Canada Pension Plan Expenditures as A Percentage of Contributory Earnings, Canada Less Quebec, 1978-2050

	Retirement		Disability		Survivors			
	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Total expenditures
				(Per cent)				
2026	5.00	1.74	.36	.14	.93	.69	.10	8.96
2027	5.07	1.79	.36	.13	.93	.70	.10	9.08
2028	5.12	1.83	.35	.13	.94	.71	.10	9.17
2029	5.15	1.86	.35	.13	.94	.71	.10	9.23
2030	5.16	1.89	.34	.13	.94	.72	.10	9.28
2031	5.12	1.92	.34	.12	.94	.72	.10	9.27
2032	5.08	1.95	.34	.12	.94	.72	.10	9.25
2033	5.03	1.96	.34	.12	.94	.73	.10	9.22
2034	4.97	1.98	.34	.12	.94	.73	.10	9.18
2035	4.91	1.99	.34	.12	.94	.73	.10	9.13
2036	4.83	1.99	.35	.12	.93	.73	.10	9.06
2037	4.76	1.99	.35	.12	.93	.73	.10	8.99
2038	4.71	1.99	.35	.12	.93	.74	.10	8.94
2039	4.66	1.99	.36	.12	.93	.74	.10	8.90
2040	4.63	1.99	.37	.12	.92	.74	.10	8.87
2041	4.62	1.98	.37	.13	.92	.74	.10	8.86
2042	4.62	1.97	.38	.13	.92	.74	.10	8.86
2043	4.64	1.97	.38	.13	.92	.74	.10	8.87
2044	4.67	1.97	.39	.13	.92	.74	.10	8.91
2045	4.72	1.97	.39	.13	.92	.74	.10	8.96
2046	4.79	1.97	.39	.13	.92	.73	.10	9.03
2047	4.87	1.98	.39	.13	.92	.73	.10	9.11
2048	4.97	1.99	.39	.12	.92	.73	.10	9.21
2049	5.07	2.00	.38	.12	.92	.73	.10	9.33
2050	5.19	2.01	.38	.12	.92	.73	.10	9.45

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan Contributory Earnings and Expenditures in Millions of Dollars,(a) Appendix C-5
Canada Less Quebec, 1978-2050

		Expenditures							
		Retirement		Disability		Survivors			
	Contributory earnings	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Total
					(Millions of dollars)				
1978	57,974	702	98	167	11	300	30	58	1,366
1980	74,469	1,074	208	216	37	438	82	74	2,129
1990	192,947	4,380	1,431	618	223	1,349	704	193	8,898
2000	390,953	11,143	3,865	1,324	523	3,141	1,998	391	22,385
2010	800,007	25,665	8,886	3,012	1,179	6,509	4,665	800	50,716
2020	1,498,757	66,428	21,958	5,776	2,199	13,339	9,828	1,499	121,027
2030	2,815,444	145,190	53,329	9,652	3,533	26,465	20,152	2,815	261,136
2040	5,393,909	249,791	107,145	19,834	6,712	49,855	39,776	5,394	478,507
2050	10,001,958	519,088	201,452	38,095	12,039	91,932	72,857	10,002	945,465

a Figures are rounded.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan Contributory Earnings and Expenditures in Millions of Dollars, Canada Less Quebec, 1978-2050

	Contributory earnings	Expenditures							
		Retirement		Disability		Survivors			
		Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Total
	(Millions of dollars)								
1978	57,974.3	702.7	97.7	166.7	11.2	300.1	29.7	58.0	1,366.1
1979	65,836.8	880.9	148.2	189.8	24.6	364.5	52.7	65.8	1,726.6
1980	74,468.7	1,073.6	208.1	215.8	37.2	438.0	81.6	74.5	2,128.7
1981	84,300.7	1,246.7	276.1	244.2	49.8	518.4	117.4	84.3	2,537.0
1982	94,824.2	1,438.6	354.4	275.7	63.7	610.6	161.6	94.8	2,999.5
1983	105,947.6	1,655.3	443.7	310.9	79.5	675.3	205.0	105.9	3,475.7
1984	117,579.7	1,902.9	544.7	349.7	97.1	746.1	254.5	117.6	4,012.6
1985	129,629.6	2,187.5	657.9	389.9	115.5	823.8	310.5	129.6	4,614.7
1986	141,379.4	2,550.0	789.9	433.2	134.6	913.3	376.7	141.4	5,339.0
1987	153,520.8	2,953.1	934.1	476.2	154.0	1,010.6	449.4	153.5	6,130.9
1988	166,119.1	3,394.1	1,089.5	522.0	175.6	1,115.7	528.6	166.1	6,991.6
1989	179,239.3	3,870.7	1,255.3	568.6	198.8	1,228.4	613.9	179.2	7,914.9
1990	192,947.2	4,380.1	1,430.7	617.8	222.8	1,348.7	704.7	192.9	8,897.8
1991	206,850.1	4,906.4	1,604.1	669.4	244.9	1,470.6	794.4	206.9	9,896.6
1992	221,585.5	5,463.8	1,788.1	724.7	266.5	1,601.4	889.9	221.6	10,955.9
1993	237,332.0	6,053.1	1,984.5	781.8	290.0	1,742.6	992.8	237.3	12,082.2
1994	254,269.5	6,675.3	2,195.3	843.0	316.0	1,895.7	1,104.0	254.3	13,283.6
1995	272,577.7	7,331.1	2,422.3	906.3	343.7	2,061.9	1,224.6	272.6	14,562.5
1996	292,616.4	8,005.3	2,670.8	975.1	373.8	2,250.6	1,356.1	292.6	15,924.3
1997	314,339.4	8,718.7	2,938.4	1,048.9	406.1	2,453.3	1,498.5	314.3	17,378.2
1998	337,880.4	9,476.3	3,226.0	1,129.4	441.0	2,669.7	1,652.6	337.9	18,932.7
1999	363,373.4	10,282.7	3,534.6	1,221.6	480.0	2,899.1	1,819.0	363.4	20,600.5
2000	390,952.9	11,143.0	3,865.2	1,324.2	522.7	3,141.1	1,998.4	391.0	22,385.6

Canada Pension Plan Contributory Earnings and Expenditures in Millions of Dollars, Canada Less Quebec, 1978-2050

	Contributory earnings	Expenditures							
		Retirement		Disability		Survivors			
		Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Total
	(Millions of dollars)								
2001	421,103.3	12,000.9	4,209.8	1,435.6	568.4	3,383.2	2,191.8	421.1	24,210.9
2002	453,520.6	12,937.5	4,580.7	1,561.8	619.2	3,639.8	2,399.5	453.5	26,192.0
2003	488,250.4	13,972.7	4,981.1	1,698.7	673.7	3,913.4	2,622.3	488.2	28,350.2
2004	525,339.5	15,126.6	5,414.4	1,850.2	733.2	4,206.3	2,860.8	525.3	30,716.9
2005	564,834.5	16,419.2	5,883.7	2,016.3	797.8	4,521.1	3,115.8	564.8	33,318.8
2006	608,819.0	17,848.1	6,375.6	2,197.0	867.4	4,862.6	3,385.9	606.8	36,143.5
2007	651,292.2	19,461.4	6,914.3	2,382.6	938.9	5,230.3	3,674.5	651.3	39,253.3
2008	698,289.8	21,284.9	7,507.2	2,578.1	1,013.8	5,626.1	3,982.9	698.3	42,691.3
2009	747,848.9	23,344.2	8,162.0	2,781.6	1,091.6	6,051.8	4,312.5	747.8	46,491.6
2010	800,007.2	25,664.9	8,886.0	3,012.6	1,178.7	6,509.5	4,664.8	800.0	50,716.4
2011	853,957.5	28,352.0	9,674.4	3,258.7	1,271.5	6,998.1	5,039.5	854.0	55,448.2
2012	910,790.2	31,332.1	10,550.0	3,465.5	1,350.0	7,523.1	5,440.5	910.8	60,572.0
2013	970,749.9	34,611.1	11,523.4	3,697.5	1,437.3	8,086.9	5,869.7	970.7	66,196.7
2014	1,034,084.6	38,195.0	12,605.1	3,955.5	1,533.4	8,692.3	6,329.1	1,034.1	72,344.3
2015	1,101,040.0	42,089.6	13,805.6	4,232.2	1,635.8	9,341.7	6,820.7	1,101.0	79,026.4
2016	1,171,110.0	46,263.4	15,133.0	4,523.2	1,743.0	10,035.1	7,340.5	1,171.1	86,208.7
2017	1,245,482.0	50,769.1	16,600.9	4,832.2	1,856.1	10,778.4	7,897.8	1,245.5	93,979.4
2018	1,324,591.0	55,621.7	18,220.5	5,145.8	1,970.5	11,574.7	8,495.9	1,324.6	102,353.1
2019	1,408,871.0	60,836.3	20,002.6	5,462.4	2,085.5	12,427.3	9,138.1	1,408.9	111,360.5
2020	1,498,757.0	66,428.2	21,958.4	5,776.3	2,199.2	13,339.3	9,827.8	1,498.8	121,027.4
2021	1,594,231.0	72,452.0	24,105.1	6,105.9	2,317.4	14,313.1	10,563.6	1,594.2	131,450.8
2022	1,696,292.0	78,873.5	26,446.1	6,461.3	2,443.8	15,352.9	11,354.2	1,696.3	142,627.4
2023	1,805,487.0	85,697.9	28,991.2	6,822.9	2,571.7	16,462.3	12,203.8	1,805.5	154,554.8
2024	1,922,357.0	92,930.4	31,750.1	7,197.1	2,703.2	17,644.7	13,116.5	1,922.4	167,263.9
2025	2,047,458.0	100,576.4	34,732.3	7,571.5	2,834.0	18,903.5	14,096.6	2,047.5	180,761.2

Canada Pension Plan Contributory Earnings and Expenditures in Millions of Dollars, Canada Less Quebec, 1978-2050

	Contributory earnings	Expenditures							
		Retirement		Disability		Survivors			
		Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Total
	(Millions of dollars)								
2026	2,180,265.0	108,940.6	37,987.9	7,952.6	2,965.2	20,239.8	15,147.1	2,180.3	195,412.9
2027	2,322,658.0	117,653.7	41,476.1	8,352.8	3,101.1	21,660.0	16,273.4	2,322.7	210,839.2
2028	2,475,446.0	126,646.2	45,195.9	8,751.3	3,235.0	23,168.3	17,479.9	2,475.4	226,951.6
2029	2,639,434.0	135,848.1	49,147.1	9,179.2	3,377.3	24,768.7	18,771.2	2,639.4	243,730.4
2030	2,815,444.0	145,190.1	53,328.9	9,651.6	3,533.1	26,465.3	20,151.7	2,815.4	261,135.6
2031	3,004,941.0	153,999.2	57,758.9	10,228.0	3,721.1	28,254.3	21,628.9	3,004.9	278,594.9
2032	3,207,911.0	162,959.5	62,414.4	10,890.9	3,935.3	30,149.6	23,203.7	3,207.9	296,760.8
2033	3,424,996.0	172,151.8	67,289.5	11,670.3	4,185.0	32,157.1	24,879.7	3,425.0	315,757.9
2034	3,656,842.0	181,656.9	72,379.6	12,526.8	4,456.9	34,282.8	26,660.9	3,656.8	335,620.2
2035	3,904,093.0	191,556.0	77,679.3	13,434.0	4,742.2	36,532.7	28,551.0	3,904.1	356,398.8
2036	4,167,099.0	201,342.0	83,056.5	14,430.3	5,053.5	38,897.4	30,556.3	4,167.1	377,502.5
2037	4,446,869.0	211,830.7	88,665.0	15,551.6	5,401.4	41,402.1	32,678.2	4,446.9	399,975.4
2038	4,744,119.0	223,249.9	94,531.6	16,835.3	5,797.2	44,056.8	34,919.8	4,744.1	424,134.4
2039	5,059,557.0	235,827.4	100,682.6	18,277.3	6,238.7	46,871.3	37,284.7	5,059.6	450,241.2
2040	5,393,909.0	249,791.1	107,145.1	19,834.3	6,711.9	49,855.4	39,776.1	5,393.9	478,507.4
2041	5,745,717.0	265,262.7	113,731.4	21,462.6	7,203.2	52,995.4	42,383.7	5,745.7	508,784.4
2042	6,118,406.0	282,602.7	120,735.9	23,163.1	7,712.5	56,330.7	45,128.2	6,118.4	541,791.2
2043	6,513,227.0	302,065.1	128,238.8	24,934.2	8,238.9	59,876.9	48,017.2	6,513.2	577,884.1
2044	6,931,429.0	323,904.3	136,320.2	26,763.5	8,778.9	63,650.0	51,057.1	6,931.4	617,405.1
2045	7,374,276.0	348,374.7	145,061.1	28,635.4	9,327.6	67,665.6	54,255.2	7,374.3	660,693.6
2046	7,843,007.0	375,729.8	154,539.6	30,533.5	9,880.1	71,939.2	57,618.2	7,843.0	708,083.3
2047	8,338,885.0	406,224.6	164,838.4	32,446.5	10,432.8	76,487.2	61,153.1	8,338.9	759,921.3
2048	8,863,170.0	440,112.7	176,037.2	34,361.0	10,981.6	81,324.6	64,866.9	8,863.2	816,546.8
2049	9,417,106.0	477,649.0	188,214.8	36,252.7	11,519.5	86,467.7	68,765.8	9,417.1	878,286.4
2050	10,001,958.0	519,088.1	201,452.5	38,094.9	12,038.8	91,932.2	72,857.1	10,002.0	945,465.2

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan Comparison of Expenditures in Millions of Dollars and as a Percentage of Contributory Earnings, Based on Most Probable Fertility Assumptions, Together with Most Probable and High Economic Assumptions, Canada Less Quebec, 1978-2050

	Expenditures in millions of dollars				Percentage of contributory earnings					
	Contributory earnings		Total expenditures		Non-indexed benefit		Indexing cost		Total	
	Most probable	High economic	Most probable	High economic	Most probable	High economic	Most probable	High economic	Most probable	High economic
1978	57,974	58,370	1,366	1,382	2.12	2.10	.24	.27	2.36	2.37
1979	65,837	66,746	1,727	1,765	2.27	2.25	.35	.39	2.62	2.64
1980	74,469	76,169	2,129	2,200	2.42	2.37	.44	.52	2.86	2.89
1981	84,301	86,598	2,537	2,642	2.48	2.41	.53	.64	3.01	3.05
1982	94,824	98,234	3,000	3,156	2.55	2.45	.61	.76	3.16	3.21
1983	105,948	111,169	3,476	3,704	2.60	2.47	.68	.86	3.28	3.33
1984	117,580	125,496	4,013	4,338	2.65	2.50	.76	.96	3.41	3.46
1985	129,630	141,308	4,615	5,068	2.72	2.54	.84	1.05	3.56	3.59
1986	141,379	159,379	5,339	5,946	2.85	2.58	.92	1.15	3.77	3.73
1987	153,521	178,951	6,131	6,937	2.99	2.66	1.00	1.22	3.99	3.88
1988	166,119	199,946	6,992	8,052	3.12	2.73	1.08	1.30	4.20	4.03
1989	179,239	222,286	7,915	9,294	3.26	2.80	1.15	1.38	4.41	4.18
1990	192,947	245,893	8,898	10,665	3.38	2.89	1.22	1.45	4.60	4.34
1995	272,578	380,229	14,562	19,566	3.88	3.37	1.46	1.78	5.34	5.15
2000	390,953	598,414	22,386	33,445	4.10	3.56	1.63	2.03	5.73	5.59
2010	800,007	1,478,324	50,716	92,592	4.50	3.91	1.84	2.35	6.34	6.26
2020	1,498,757	3,336,034	121,027	267,548	5.80	5.15	2.28	2.87	8.08	8.02
2030	2,815,444	7,556,474	261,136	696,154	6.54	5.65	2.74	3.56	9.28	9.21
2040	5,393,909	17,448,048	478,507	1,533,701	6.02	5.11	2.85	3.68	8.87	8.79
2050	10,001,958	38,995,264	945,465	3,641,725	6.59	5.64	2.86	3.70	9.45	9.34

Expenses are "non-indexed."

Source Data prepared for Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan Comparison of Expenditures in Millions of Dollars and as a Percentage of Contributory Earnings, Based on Most Probable Economic Assumptions, Together with Most Probable and Low-Low Fertility Assumptions, Canada Less Quebec, 1978-2050

Appendix C-8

	Expenditures in millions of dollars				Percentage of contributory Earnings					
	Contributory earnings		Total expenditures		Non-indexed benefit		Indexing cost		Total	
	Most probable	Low-Low fertility	Most probable	Low-Low fertility	Most probable	Low-Low fertility	Most probable	Low-Low fertility	Most probable	Low-Low fertility
1978	57,974	57,974	1,366	1,366	2.12	2.12	.24	.24	2.36	2.36
1979	65,837	65,837	1,727	1,727	2.27	2.27	.35	.35	2.62	2.62
1980	74,469	74,467	2,129	2,129	2.42	2.42	.44	.44	2.86	2.86
1981	84,301	84,301	2,537	2,537	2.48	2.48	.53	.53	3.01	3.01
1982	94,824	94,824	3,000	3,000	2.55	2.55	.61	.61	3.16	3.16
1983	105,948	105,948	3,476	3,476	2.60	2.60	.68	.68	3.28	3.28
1984	117,580	117,580	4,013	4,013	2.65	2.65	.76	.76	3.41	3.41
1985	129,630	129,630	4,615	4,615	2.72	2.72	.84	.84	3.56	3.56
1986	141,379	141,379	5,339	5,339	2.85	2.85	.92	.92	3.77	3.77
1987	153,521	153,521	6,131	6,131	2.99	2.99	1.00	1.00	3.99	3.99
1988	166,119	166,119	6,992	6,992	3.12	3.12	1.08	1.08	4.20	4.20
1989	179,239	179,239	7,915	7,915	3.26	3.26	1.15	1.15	4.41	4.41
1990	192,947	192,934	8,898	8,898	3.38	3.38	1.22	1.22	4.60	4.60
1995	272,578	271,610	14,562	14,500	3.88	3.88	1.46	1.46	5.34	5.34
2000	390,953	383,127	22,386	22,288	4.10	4.17	1.63	1.65	5.73	5.82
2010	800,007	743,442	50,716	50,510	4.50	4.82	1.84	1.97	6.34	6.79
2020	1,498,757	1,355,978	121,027	120,290	5.80	6.38	2.28	2.49	8.08	8.87
2030	2,815,444	2,434,323	261,136	258,681	6.54	7.49	2.74	3.14	9.28	10.63
2040	5,393,909	4,471,399	478,507	469,326	6.02	7.12	2.85	3.38	8.87	10.50
2050	10,001,958	8,116,311	945,465	860,635	6.59	7.25	2.86	3.35	9.45	10.60

Expenses are "non-indexed."

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan, Comparison of Population, Expenditures, Fund Size, Unfunded Actuarial Liability, and Pay-go Contributions, Canada Less Quebec, and Ontario, 1975-2050

	Canada less Quebec	Ontario	Ratio of Ontario to Canada less Quebec
	(Thousands)		
Male population			
1975	8,517	4,213	.49
2000	11,861	5,827	.49
2025	14,498	7,140	.49
2050	16,321	8,110	.50
Female population			
1975	8,449	4,219	.50
2000	11,987	5,900	.49
2025	14,884	7,326	.49
2050	16,915	8,388	.50
Projected expenditures	(Billions of dollars)		
1978	1.4	.7	.50
2000	22.4	11.9	.53
2025	180.8	91.0	.50
2050	945.5	472.8	.50
Initial fund, Dec. 31, 1977	12.6	6.9	.55
Dec. 31, 1977 unfunded actuarial liability (entry age normal)	98.5	47.5	.48
Pay-go contributions	(Percentage of expenditures)		
1978	2.36	2.41	1.02
2000	5.73	6.07	1.06
2025	8.83	8.89	1.01
2050	9.45	9.35	.99

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable economic and fertility assumptions.

Canada Pension Plan, Comparison of Entry Age Normal Costs and Allocation of Initial Assets, Canada Less Quebec, Ontario

Entry age normal costs(a)	Canada less Quebec	Ontario	
		Canadian investment rate of return	Ontario investment rate of return
		(Per cent)	
Retirement			
Non-indexed benefit	5.06	5.08	4.49
Indexing cost	2.09	2.10	1.81
Total	7.15	7.17	6.30
Welfare - Non-indexed benefit			
Disability	.38	.38	.36
Survivor	1.05	1.04	.93
Total	1.43	1.42	1.29
Welfare - Indexing cost			
Disability	.14	.14	.13
Survivor	.84	.82	.72
Total	.98	.97	.85
Total			
Non-indexed benefit	6.49	6.50	5.78
Indexing cost	3.07	3.07	2.66
Total	9.56	9.57	8.45
Initial funds		(Billions of dollars)	
Retirement	9.7	5.3	5.3
Welfare	2.9	1.6	1.6
Total	12.6	6.9	6.9

a Excludes expenses which equal .1 per cent of contributory earnings.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable economic and fertility assumptions.

Canada Pension Plan, Comparison of Unfunded Liabilities and Fifty-year Liquidation Percentage,(a) Canada Less Quebec and Ontario

	Canada less Quebec		Ontario			
			Canadian investment rate of return		Ontario investment rate of return	
	(Billions of dollars)	(Per cent)	(Billions of dollars)	(Per cent)	(Billions of dollars)	(Per cent)
Retirement						
Non-indexed	47.3	1.38	24.7	1.44	23.0	1.47
Indexed	23.7	.69	12.4	.72	11.4	.73
Total	71.0	2.07	37.0	2.16	34.4	2.21
Welfare						
Non-indexed	15.2	.44	7.9	.46	7.3	.47
Indexed	12.4	.36	6.3	.37	5.8	.37
Total	27.5	.80	14.2	.83	13.1	.84
Total						
Non-indexed	62.5	1.82	32.6	1.90	30.3	1.94
Indexed	36.1	1.05	18.7	1.09	17.2	1.10
Total	98.5	2.87	51.2	2.99	47.5	3.05

a Contribution rate as percentage of contributory earnings required to liquidate unfunded liability over fifty-year period 1980-2029.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

APPENDIX D - CANADA PENSION PLAN FUND ANALYSIS

(Unless otherwise stated the basis for the Table is Canada less Quebec and the Royal Commission's most probable fertility and economic assumptions)

Appendix	D-1	Comparison of Contribution Rates And Fund as a Multiple of Benefits for Funds A, B, and C, Selected Years	275
	D-2	Comparison of Contribution Rates and Fund as a Multiple of Benefits for Funds D, E, and F, Selected Years	276
	D-3	Benefits and Expenses, Contributions, Cash Flow, Interest and Fund Size for Funds A, B, and C with contribution rates for Funds B and C, Annually, 1978 to 2050	277
	D-4	Benefits and Expenses, Contributions, Cash Flow, Interest and Fund Sizes for Funds D, E, and F with contribution rates for Fund D - Entry Age Normal Funding Fund E - Retirement Benefits entry age normal, balance pay-go Fund F - Non-indexed Retirement Benefits entry age normal, balance pay-go Annually, 1978 to 2050	280
	D-5	Comparison of Contribution Rates for Fund D, entry age normal funding, Four Fertility and Three Economic Assumptions, Selected Years	283
	D-6	Comparison of Entry Age Normal Costs, Unfunded Liabilities and Fifty-Year Amortization Percentages of Unfunded Liabilities, with breakdown of Retirement Benefits, indexed and non-indexed, and Welfare Benefits, indexed and non-indexed, Four Fertility and Three Economic Assumptions	284

D-7 Comparison of Contribution Rates and Fund as a Multiple of Benefits for Funds A, B, and C, with Population Reduced to Eliminate the Baby Boom 285

D-8 Comparison of Expenditures as a Percentage of Contributory Earnings, Most Probable Economic Assumptions with Variance of +5% and -5% in Real Growth of Earnings 286

D-9 Fund A, with and without Earnings Test 287

D-10 Comparison of Expenditures as a Percentage of Contributory Earnings, Fund B, with and without Earnings Test 288

D-11 Comparison of Expenditures as a Percentage of Contributory Earnings, Fund C, with and without Earnings Test 289

D-12 Fund D, Entry Age Normal Costs, Allocation of Initial Assets and Unfunded Liabilities, with and without Earnings Test 290

D-13 Financial Effect of Baby Boom on Critical years, Fund A 291

D-14 Comparison of Expenditures as Percentages of Contributory Earnings and Fund as a Multiple of Expenditures, including and excluding the Baby Boom population, Fund B, Canada less Quebec and Ontario 292

D-15 Comparison of Expenditures as Percentages of Contributory Earnings and Fund as a Multiple of Expenditures, including and excluding the Baby Boom population, Fund C, Canada less Quebec and Ontario 293

D-16 Stipulated Contribution Rate Example 3.6% to 1985; .2% increase yearly thereafter to 2000; constant at 8% thereafter 294

Canada Pension Plan, Comparison of Contribution Rates and Fund as a Multiple of Benefits for Funds A, B, and C, Canada Less Quebec, 1978-2050

	Pay-go	Contribution Rate			Fund as multiple of benefits		
		Fund A	Fund B	Fund C	Fund A	Fund B	Fund C
		(Percent)					
1978	2.36	3.60	3.60	3.60	10.5	10.5	10.5
1980	2.86	3.60	3.60	3.60	8.5	8.5	8.5
1990	4.61	3.60	4.61	3.60	4.0	4.7	4.0
2000	5.73	3.60	5.73	5.07	.3	3.8	1.6
2010	6.34	(a)	6.34	6.05	(b)	3.1	.7
2020	8.08		8.08	7.92	-	2.4	.3
2030	9.28		9.28	9.19	-	2.1	.1
2040	8.87		8.87	8.83	-	2.1	.1
2050	9.45		9.45	9.43	-	2.0	0

a Fund A would be exhausted in year 2001 and thereafter contributions would be at the pay-go rate unless other revenue were found.

b Under Fund A, the cash flow becomes negative in 1986. Interest is first required from the provinces and the fund reaches its maximum in 1992.

Source Data prepared for the Royal Commission on the Status of Persons in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Contribution Rates and Fund as a Multiple of Benefits for Funds D, E, and F, Canada Less Quebec, 1978 - 2050

Appendix D-2

	Contribution Rate				Fund as multiple of benefits		
	Pay-go	Fund D	Fund E	Fund F	Fund D	Fund E	Fund F
		(Percent)					
1978	2.36	3.60	3.60	3.60	10.5	10.5	10.5
1980	2.86	12.53	9.48	6.98	11.7	10.6	9.7
1990	4.61	12.53	10.82	8.78	24.6	19.1	13.9
2000	5.73	12.53	11.11	9.31	31.8	24.9	17.5
2010	6.34	12.53	11.24	9.57	36.6	28.7	19.9
2020	8.08	12.53	11.40	10.08	35.1	27.5	18.7
2030	9.28	9.66	9.38	9.18	33.9	26.3	17.6
2040	8.87	9.66	9.41	9.30	35.1	27.0	18.1
2050	9.45	9.66	9.40	9.32	33.7	25.8	17.3

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, All Benefits and Expenses, Canada less Quebec, 1978-2050

		Fund A 3.6% contribution rate				Fund B Cash flow not negative					Fund C Cash flow not greater than interest when negative				
	Benefits and expenses	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund
	($M)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
1978	1366	2087	721	1012	14.3	3.60	2087	721	1012	14.3	3.60	2087	721	1012	14.3
1979	1727	2370	644	1163	16.1	3.60	2370	644	1163	16.1	3.60	2370	644	1163	16.1
1980	2129	2681	552	1309	18.0	3.60	2681	552	1309	18.0	3.60	2681	552	1309	18.0
1981	2537	3035	498	1455	20.0	3.60	3035	498	1455	20.0	3.60	3035	498	1455	20.0
1982	2999	3414	414	1608	22.0	3.60	3414	414	1608	22.0	3.60	3414	414	1608	22.0
1983	3476	3814	338	1766	24.1	3.60	3814	338	1766	24.1	3.60	3814	338	1766	24.1
1984	4013	4233	220	1930	26.2	3.60	4233	220	1930	26.2	3.60	4233	220	1930	26.2
1985	4615	4667	52	2095	28.4	3.60	4667	52	2095	28.4	3.60	4667	52	2095	28.4
1986	5339	5090	-248	2255	30.4	3.78	5339	0	2260	30.6	3.60	5090	-248	2255	30.4
1987	6131	5527	-603	2411	32.2	3.99	6131	0	2442	33.1	3.60	5527	-603	2411	32.2
1988	6992	5980	-1010	2554	33.7	4.21	6992	0	2641	35.7	3.60	5980	-1010	2554	33.7
1989	7915	6453	-1461	2668	34.9	4.42	7915	0	2847	38.6	3.60	6453	-1461	2668	34.9
1990	8898	6946	-1951	2745	35.7	4.61	8898	0	3052	41.6	3.60	6946	-1951	2745	35.7
1991	9897	7447	-2449	2776	36.1	4.78	9897	0	3235	44.9	3.60	7447	-2449	2776	36.1
1992	10956	7977	-2978	2782	35.9	4.94	10956	0	3435	48.3	3.67	8133	-2822	2823	36.1
1993	12082	8544	-3537	2751	35.1	5.09	12082	0	3645	51.9	3.91	9271	-2811	2812	36.1
1994	13284	9154	-4129	2676	33.6	5.22	13284	0	3864	55.8	4.13	10498	-2785	2786	36.1
1995	14562	9813	-4749	2545	31.4	5.34	14562	0	4083	59.9	4.33	11811	-2750	2751	36.1
1996	15924	10534	-5389	2358	28.4	5.44	15924	0	4309	64.2	4.52	13213	-2710	2711	36.1
1997	17378	11316	-6061	2107	24.4	5.53	17378	0	4544	68.7	4.68	14710	-2668	2669	36.1
1998	18933	12164	-6768	1774	19.4	5.60	18933	0	4792	73.5	4.83	16308	-2624	2625	36.1
1999	20600	13081	-7518	1366	13.3	5.67	20600	0	5057	78.6	4.96	18009	-2590	2591	36.1
2000	22386	14074	-8310	862	5.8	5.73	22386	0	5348	83.9	5.07	19822	-2563	2564	36.1

		Fund A 3.6% contribution rate				Fund B Cash flow not negative					Fund C Cash flow not greater than interest when negative				
	Benefits and expenses	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund
	($M)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
2001	24211	15160	-9050	272	-3.0	5.75	24211	0	5663	89.6	5.15	21676	-2534	2535	36.1
2002	26192	16327	-9864	-346	-13.2	5.78	26192	0	5996	95.6	5.22	23687	-2504	2505	36.1
2003	28350	17577	-10772	-1014	-25.0	5.81	28350	0	6350	101.9	5.30	25876	-2473	2474	36.1
2004	30717	18912	-11804	-1785	-38.5	5.85	30717	0	6725	108.7	5.38	28274	-2442	2443	36.1
2005	33319	20334	-12984	-2673	-54.2	5.90	33319	0	7126	115.8	5.47	30902	-2416	2417	36.1
2006	36143	21845	-14297	-3696	-72.2	5.96	36143	0	7555	123.3	5.56	33755	-2388	2389	36.1
2007	39253	23447	-15806	-4872	-92.9	6.03	39253	0	8005	131.3	5.66	36895	-2357	2358	36.1
2008	42691	25138	-17552	-6224	-116.7	6.11	42691	0	8479	139.8	5.78	40360	-2330	2331	36.1
2009	46492	26923	-19568	-7778	-144.0	6.22	46492	0	8981	148.8	5.91	44184	-2307	2308	36.1
2010	50716	28800	-21915	-9566	-175.5	6.34	50716	0	9524	158.3	6.05	48409	-2307	2308	36.1
2011	55448	30742	-24705	-11625	-211.8	6.49	55448	0	10133	168.5	6.22	53141	-2307	2308	36.1
2012	60572	32788	-27783	-14000	-253.6	6.65	60572	0	10782	179.2	6.40	58264	-2307	2308	36.1
2013	66197	34947	-31249	-16729	-301.6	6.82	66197	0	11472	190.7	6.58	63889	-2307	2308	36.1
2014	72344	37227	-35116	-19862	-356.6	7.00	72344	0	12206	202.9	6.77	70037	-2307	2808	36.1
2015	79026	39637	-39388	-23449	-419.4	7.18	79026	0	12987	215.9	6.97	76719	-2307	2308	36.1
2016	86209	42160	-44048	-27545	-491.0	7.36	86209	0	13818	229.7	7.16	83901	-2307	2308	36.1
2017	93979	44837	-49141	-32209	-572.3	7.55	93979	0	14702	244.4	7.36	91672	-2307	2308	36.1
2018	102353	47685	-54667	-37504	-644.5	7.73	102353	0	15643	260.1	7.55	100046	-2307	2308	36.1
2019	111361	50719	-60640	-43498	-768.7	7.90	111361	0	16645	276.7	7.74	109053	-2307	2308	36.1
2020	121027	53955	-67071	-50266	-866.0	8.08	121027	0	17710	294.4	7.92	118720	-2307	2308	36.1
2021	131451	57392	-74058	-57888	-1017.9	8.25	131451	0	18843	313.3	8.10	129143	-2307	2308	36.1
2022	142627	61067	-81560	-66452	-1166.0	8.41	142627	0	20050	333.3	8.27	140320	-2307	2308	36.1
2023	154555	64998	-89556	-76053	-1331.6	8.56	154555	0	21333	354.7	8.43	152247	-2307	2308	36.1
2024	167264	69205	-98058	-86788	-1516.4	8.70	167264	0	22698	377.4	8.58	164956	-2307	2308	36.1
2025	180761	73708	-107052	-98762	-1722.2	8.83	180761	0	24150	401.5	8.72	178454	-2307	2308	36.1

		Fund A 3.6% contribution rate				Fund B Cash flow not negative					Fund C Cash flow not greater than interest when negative				
	Benefits and expenses	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund
	($M)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
2026	195413	78490	-116922	-112093	-1951.3	8.96	195413	0	25696	427.2	8.86	193105	-2307	2308	36.1
2027	210839	83616	-127223	-126914	-2205.4	9.08	210839	0	27341	454.5	8.98	208532	-2307	2308	36.1
2028	226952	89116	-137835	-143349	-2486.6	9.17	226952	0	29090	483.6	9.07	224644	-2307	2308	36.1
2029	243730	95020	-148710	-161519	-2796.8	9.23	243730	0	30952	514.6	9.15	241423	-2307	2308	36.1
2030	261136	101356	-159779	-181550	-3138.1	9.28	261136	0	32933	547.5	9.19	258828	-2307	2308	36.1
2031	278595	108178	-170416	-203567	-3512.1	9.27	278595	0	35041	582.6	9.19	276287	-2307	2308	36.1
2032	296761	115485	-181275	-227675	-3921.1	9.25	296761	0	37284	619.8	9.18	294453	-2307	2308	36.1
2033	315758	123300	-192457	-254026	-4367.6	9.22	315758	0	39670	659.5	9.15	313450	-2307	2308	36.1
2034	335620	131646	-203973	-282787	-4854.3	9.18	335620	0	42208	701.7	9.11	333313	-2307	2308	36.1
2035	356399	140547	-215851	-314128	-5384.3	9.13	356399	0	44910	746.6	9.07	354091	-2307	2308	36.1
2036	377503	150016	-227486	-348235	-5960.0	9.06	377503	0	47784	794.4	9.00	375195	-2307	2308	36.1
2037	399975	160087	-239887	-385279	-6585.2	8.99	399975	0	50842	845.3	8.94	397668	-2307	2308	36.1
2038	424134	170788	-253345	-425504	-7264.0	8.94	424134	0	54096	899.4	8.89	421827	-2307	2308	36.1
2039	450241	182144	-268096	-469187	-8001.3	8.90	450241	0	57558	956.9	8.85	447934	-2307	2308	36.1
2040	478507	194181	-284326	-516633	-8802.3	8.87	478507	0	61242	1018.2	8.83	476200	-2307	2308	36.1
2041	508784	206846	-301938	-568178	-9672.4	8.86	508784	0	65161	1083.3	8.81	506477	-2307	2308	36.1
2042	541791	220263	-321528	-624177	-10618.1	8.86	541791	0	69331	1152.6	8.82	539483	-2307	2308	36.1
2043	577884	234476	-343407	-685052	-11646.6	8.87	577884	0	73768	1226.4	8.84	575576	-2307	2308	36.1
2044	617405	249531	-367873	-751265	-12765.7	8.91	617405	0	78489	1304.9	8.87	615097	-2307	2308	36.1
2045	660694	265474	-395219	-823329	-13984.3	8.96	660694	0	83512	1388.4	8.93	658386	-2307	2308	36.1
2046	708083	282348	-425734	-901803	-15311.8	9.03	708083	0	88858	1477.3	9.00	705776	-2307	2308	36.1
2047	759921	300200	-459721	-987308	-16758.8	9.11	759921	0	94543	1571.8	9.09	757614	-2306	2307	36.1
2048	816547	319074	-497472	-1080514	-18336.8	9.21	816547	0	100596	1672.4	9.19	814240	-2306	2307	36.1
2049	878286	339016	-539270	-1182169	-20058.3	9.33	878286	0	107033	1779.4	9.30	875979	-2306	2307	36.1
2050	945465	360070	-585394	-1293083	-21936.7	9.45	945465	0	113884	1893.3	9.43	943157	-2307	2308	36.1

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, All Benefits and Expenses, Canada Less Quebec, 1978-2050

		Fund D					Fund E					Fund F				
		Entry age normal funding					Entry age normal funding of retirement benefits, pay-go funding of balance					Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance				
	Benefits and expenses	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund
	($M)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
1978	1366	3.60	2087	721	1012	14.3	3.60	2087	721	1012	14.3	3.60	2087	721	1012	14.3
1979	1727	3.60	2370	644	1163	16.1	3.60	2370	644	1163	16.1	3.60	2370	644	1163	16.1
1980	2129	12.53	9328	7199	1441	24.8	9.48	7058	4929	1396	22.5	6.98	5195	3066	1359	20.6
1981	2537	12.53	10559	8022	2140	34.9	9.52	8023	5486	1907	29.9	7.06	5954	3417	1716	25.7
1982	2999	12.53	11877	8878	2959	46.8	9.56	9062	6062	2502	38.4	7.15	6778	3779	2128	31.6
1983	3476	12.53	13271	9795	3912	60.5	9.59	10157	6682	3191	48.3	7.22	7654	4178	2603	38.4
1984	4013	12.53	14728	10715	5013	76.2	9.62	11308	7296	3983	59.6	7.30	8582	4570	3146	46.1
1985	4615	12.53	16237	11622	6261	94.1	10.11	13101	8486	4887	72.9	7.83	10153	5538	3768	55.4
1986	5339	12.53	17709	12370	7636	114.1	10.63	15032	9693	5929	88.6	8.41	11889	6550	4497	66.5
1987	6131	12.53	19229	13098	9181	136.4	10.68	16396	10265	7138	106.0	8.51	13060	6929	5354	78.7
1988	6992	12.53	20807	13816	10901	161.1	10.73	17822	10830	8484	125.3	8.60	14290	7299	6307	92.3
1989	7915	12.53	22451	14536	12799	188.4	10.77	19312	11397	9968	146.6	8.69	15582	7667	7354	107.4
1990	8898	12.53	24168	15270	14799	218.5	10.82	20874	11976	11531	170.2	8.78	16937	8040	8452	123.9
1991	9897	12.53	25909	16013	16723	251.2	10.86	22455	12558	13033	195.7	8.85	18305	8408	9501	141.8
1992	10956	12.53	27755	16799	18823	286.9	10.89	24131	13175	14674	223.6	8.92	19755	8799	10646	161.2
1993	12082	12.53	29727	17645	21107	325.6	10.92	25923	13841	16457	253.9	8.98	21306	9224	11888	182.3
1994	13284	12.53	31849	18565	23588	367.8	10.95	27853	14569	18393	286.9	9.04	22975	9692	13232	205.2
1995	14562	12.53	34142	19579	26274	413.6	10.98	29937	15374	20488	322.7	9.09	24777	10214	14680	230.1
1996	15924	12.53	36652	20728	29191	463.5	11.01	32223	16299	22761	361.8	9.14	26754	10830	16246	257.2
1997	17378	12.53	39373	21995	32365	517.9	11.04	34699	17321	25237	404.3	9.19	28893	11515	17950	286.7
1998	18933	12.53	42321	23389	35823	577.1	11.06	37378	18446	27936	450.7	9.24	31205	12272	19805	318.8
1999	20600	12.53	45515	24914	39596	641.6	11.09	40281	19681	30883	501.3	9.28	33707	13107	21830	353.7
2000	22386	12.53	48969	26583	43694	711.9	11.11	43418	21032	34092	556.4	9.31	36408	14022	24039	391.8

		Fund D					Fund E					Fund F				
		Entry age normal funding					Entry age normal funding of retirement benefits, pay-go funding of balance					Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance				
	Benefits and expenses	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund
	($M)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
2001	24211	12.53	52746	28535	48090	788.5	11.12	46820	22609	37548	616.6	9.34	39316	15105	26425	433.3
2002	26192	12.53	56806	30614	52872	872.0	11.13	50482	24290	41312	682.2	9.36	42447	16255	29022	478.6
2003	28350	12.53	61156	32806	58069	962.9	11.14	54406	26056	45408	753.6	9.38	45805	17455	31849	527.9
2004	30717	12.53	65802	35085	63712	1061.7	11.16	58605	27888	49860	831.4	9.40	49406	18689	34921	581.5
2005	33319	12.53	70749	37430	69848	1169.0	11.17	63085	29767	54703	915.8	9.43	53257	19938	38260	639.7
2006	36143	12.53	76008	39864	76532	1285.3	11.18	67860	31716	59974	1007.5	9.45	57355	21212	41889	702.8
2007	39253	12.53	81578	42325	83773	1411.4	11.20	72917	33664	65678	1106.9	9.48	61714	22461	45807	771.0
2008	42691	12.53	87465	44773	91605	1547.8	11.21	78271	35580	71847	1214.3	9.50	66354	23663	50038	844.7
2009	46492	12.53	93672	47181	100062	1695.1	11.22	83926	37435	78509	1330.2	9.53	71285	24794	54600	924.1
2010	50716	12.53	100205	49489	109276	1853.8	11.24	89915	39198	85763	1455.2	9.57	76547	25830	59558	1009.5
2011	55448	12.53	106963	51515	119467	2024.8	11.26	96144	40696	93784	1589.7	9.61	82064	26616	65034	1101.2
2012	60572	12.53	114082	53510	130443	2208.8	11.27	102652	42080	102412	1734.2	9.65	87866	27294	70910	1199.4
2013	66197	12.53	121592	55395	142248	2406.4	11.29	109551	43355	111681	1889.2	9.69	94071	27874	77205	1304.5
2014	72344	12.53	129525	57181	154924	2618.5	11.30	116872	44528	121622	2055.4	9.74	100712	28367	83939	1416.8
2015	79026	12.53	137912	58885	168527	2845.9	11.32	124631	45605	132272	2233.2	9.79	107809	28783	91132	1536.7
2016	86209	12.53	146688	60479	183106	3089.5	11.34	132772	46564	143672	2423.5	9.85	115328	29119	98813	1664.6
2017	93979	12.53	156004	62024	198720	3350.3	11.36	141426	47446	155860	2626.8	9.91	123380	29401	107004	1801.0
2018	102353	12.53	165913	63559	215433	3629.2	11.37	150620	48267	168886	2843.9	9.96	131993	29640	115739	1946.4
2019	111361	12.53	176469	65109	233314	3927.7	11.38	160400	49039	182796	3075.8	10.02	141211	29851	125046	2101.3
2020	121027	12.53	187728	66700	252433	4246.8	11.40	170805	49778	197644	3323.2	10.08	151072	30045	134963	2266.3
2021	131451	12.53	199687	68236	272889	4587.9	11.41	181859	50409	213491	3587.1	10.14	161617	30166	145525	2442.0
2022	142627	12.53	212470	69843	294743	4952.5	11.42	193682	51055	230389	3868.5	10.20	172942	30315	156770	2629.1
2023	154555	12.53	226147	71593	318107	5342.2	11.43	206306	51751	248410	4168.7	10.25	185073	30519	168749	2828.3
2024	167264	12.53	240786	73522	343075	5758.8	11.43	219798	52534	267638	4488.9	10.30	198073	30809	181506	3040.7
2025	180761	12.53	256456	75694	369774	6204.3	11.44	234199	53438	288144	4830.5	10.35	211977	31215	195100	3267.0

		Fund D					Fund E					Fund F				
		Entry age normal funding					Entry age normal funding of retirement benefits, pay-go funding of balance					Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance				
	Benefits and expenses	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund
	($M)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
2026	195413	12.53	273091	77678	398318	6680.3	11.44	249474	54061	310013	5194.5	10.40	226813	31400	209587	3508.0
2027	210839	12.53	290926	80087	428816	7189.2	11.44	265826	54986	333330	5582.8	10.45	242691	31852	225018	3764.8
2028	226952	12.53	310064	83112	461439	7733.7	11.44	283311	56359	358203	5997.4	10.49	259646	32694	241472	4039.0
2029	243730	12.53	330604	86874	496349	8317.0	11.44	302054	58323	384767	6440.5	10.52	277778	34048	259034	4332.1
2030	261136	9.66	271852	10717	532455	8860.1	9.38	263958	2823	412236	6855.6	9.18	258387	-2747	277209	4606.5
2031	278595	9.66	290150	11555	567231	9438.9	9.38	281730	3135	438802	7297.5	9.21	276625	-1969	294787	4899.4
2032	296761	9.66	309748	12987	604298	10056.2	9.38	300795	4034	467106	7768.6	9.23	296099	-661	313549	5212.2
2033	315758	9.66	330709	14951	643834	10715.0	9.38	321250	5492	497278	8271.4	9.25	316887	1129	333598	5547.0
2034	335620	9.66	353096	17475	686036	11418.5	9.38	343096	7476	529489	8808.4	9.27	338974	3353	355061	5905.4
2035	356399	9.66	376970	20571	731113	12170.2	9.38	366358	9959	563892	9382.2	9.28	362362	5964	378040	6289.4
2036	377503	9.66	402365	24862	779290	12974.3	9.39	391107	13604	600681	9996.5	9.29	386986	9484	402669	6701.5
2037	399975	9.66	429379	29403	830827	13834.6	9.39	417490	17514	640056	10654.1	9.29	413125	13150	429108	7143.8
2038	424134	9.66	458080	33946	885953	14754.5	9.39	445620	21486	682202	11357.8	9.29	440903	16769	457469	7618.0
2039	450241	9.66	488538	38297	944898	15737.7	9.40	475557	25315	727302	12110.4	9.30	470392	20150	487877	8126.1
2040	478507	9.66	520822	42315	1007872	16787.8	9.41	507307	28800	775525	12914.7	9.30	501610	23102	520437	8669.6
2041	508784	9.66	554792	46008	1075140	17909.0	9.41	540685	31900	827053	13773.7	9.30	534214	25429	555262	9250.3
2042	541791	9.66	590778	48987	1146966	19104.9	9.41	575999	34208	882061	14689.9	9.30	568736	26945	592449	9869.7
2043	577884	9.66	628901	51017	1223510	20379.5	9.42	613362	35478	940721	15666.1	9.29	605343	27459	632096	10529.2
2044	617405	9.66	669281	51876	1305115	21736.5	9.42	652869	35464	1003197	16704.8	9.29	644181	26776	674302	11230.3
2045	660694	9.66	712042	51348	1391933	23179.7	9.42	694616	33922	1069627	17808.3	9.29	685405	24711	719133	11974.2
2046	708083	9.66	757301	49218	1484285	24713.2	9.42	738692	30609	1140223	18979.2	9.30	729153	21070	766684	12761.9
2047	759921	9.66	805182	45261	1582356	26340.9	9.42	785198	25277	1215057	20219.5	9.30	775585	15664	817012	13594.6
2048	816547	9.66	855805	39259	1686420	28066.5	9.41	834231	17684	1294316	21531.5	9.31	824847	8301	870184	14473.1
2049	878286	9.66	909292	31006	1796736	29894.3	9.41	885870	7583	1378126	22917.2	9.31	877075	-1210	926258	15398.1
2050	945465	9.66	965764	20299	1913525	31828.1	9.40	940196	-5268	1466596	24378.5	9.32	932405	-13060	985272	16370.3

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Contribution Rates for Fund D, Entry Age Normal, Various Economic and Fertility Assumptions, Canada Less Quebec, 1978-2050

	Pay-go contribution rate(a)	Assumptions Economic: / Fertility:	Most probable				Low	High
			Most probable	Low/Low	Low	High	Most probable	Most probable
			(Percentage of earnings)					
1978	2.36		3.60	3.60	3.60	3.60	3.60	3.60
1980	2.86		12.53	12.67	12.60	12.41	12.49	12.61
1990	4.61		12.53	12.67	12.60	12.41	12.49	12.61
2000	5.73		12.53	12.67	12.60	12.41	12.49	12.61
2010	6.34		12.53	12.67	12.60	12.41	12.49	12.61
2020	8.08		12.53	12.67	12.60	12.41	12.49	12.61
2030	9.28		9.66	9.65	9.65	9.66	9.64	9.70
2040	8.87		9.66	9.65	9.65	9.66	9.64	9.70
2050	9.45		9.66	9.65	9.65	9.66	9.64	9.70

a Pay-go contribution rates are based on the most probable fertility and economic assumptions.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Assumptions: Economic: / Fertility:	Most probable / Most probable	Most probable / Low/low	Most probable / Low	Most probable / High	Low / Most probable	High / Most probable
Entry age normal costs			(Per cent)			
Retirement						
Non-indexed benefit	5.06	5.06	5.06	5.06	5.47	5.40
Indexing cost	2.09	2.09	2.09	2.09	1.67	2.79
Total	7.15	7.15	7.15	7.15	7.14	7.19
Welfare - non-indexed benefit						
Disability	.38	.38	.38	.38	.40	.34
Survivor	1.05	1.05	1.05	1.05	1.18	.85
Total	1.43	1.43	1.42	1.43	1.58	1.19
Welfare - indexing cost						
Disability	.14	.14	.14	.14	.12	.18
Survivor	.84	.83	.83	.84	.70	1.04
Total	.98	.97	.97	.98	.82	1.22
Total						
Non-indexed benefit	6.49	6.49	6.48	6.49	7.05	4.92
Indexing cost	3.07	3.06	3.06	3.07	2.49	4.68
Total(a)	9.56	9.55	9.54	9.56	9.54	9.60

Unfunded liabilities and fifty-year liquidation percentages(b)

	($B)	(%)	($B)	(%)	($B)	(%)	($B)	(%)	($B)	(%)	($B)	(%)
Retirement												
Non-indexed benefit	47.3	1.38	47.3	1.45	47.3	1.42	47.3	1.32	49.2	1.48	44.5	1.20
Indexing cost	23.7	.69	23.7	.73	23.7	.71	23.7	.66	18.8	.57	33.1	.90
Total	71.0	2.07	70.9	2.18	70.9	2.13	71.0	1.98	68.0	2.05	77.5	2.10
Welfare												
Non-indexed benefit	15.2	.44	15.2	.47	15.2	.45	15.2	.42	16.3	.49	13.6	.37
Indexing cost	12.4	.36	12.3	.38	12.3	.37	12.4	.35	10.1	.31	16.4	.44
Total	27.5	.80	27.5	.84	27.5	.82	27.6	.77	26.5	.80	30.0	.81
Total												
Non-indexed benefit	62.5	1.82	62.5	1.92	62.5	1.87	62.5	1.74	65.5	1.97	58.1	1.57
Indexing cost	36.1	1.05	36.0	1.11	36.0	1.01	36.1	1.01	28.9	.88	49.5	1.34
Total	98.5	2.87	98.4	3.02	98.4	2.95	98.5	2.75	94.4	2.85	107.5	2.91

a Excludes expenses which equal 1 per cent of contributory earnings. Costs are expressed as a percentage of contributory earnings.

b Contribution rate as a percentage of contributory earnings required to liquidate unfunded liability over fifty-year period from 1980 to 2029.

Source: Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan, Comparison of Contribution Rates and Fund as a Multiple of Benefits for Funds A, B, and C, with Population Reduced to Eliminate the Baby Boom, Canada Less Quebec, 1978-2050

	Contribution Rate				Fund as multiple of benefits		
	Pay-go	Fund A	Fund B	Fund C	Fund A	Fund B	Fund C
		(Percent)					
1978	2.44	3.60	3.60	3.60	10.5	10.5	10.5
1980	3.05	3.60	3.60	3.60	8.3	8.3	8.3
1990	4.96	3.60	4.96	3.62	3.4	4.4	3.4
2000	6.21	(a)	6.21	5.62	-	3.5	1.4
2010	6.94		6.94	6.67	-	3.0	.6
2020	8.26		8.26	8.12	-	2.4	.3
2030	8.26		8.90	8.82	-	2.2	.1
2040	8.91		8.91	8.87	-	2.2	.1
2050	9.34		9.34	9.22	-	2.1	.1

a Under Fund A, the fund would be exhausted in year 1999 and thereafter contribution would be at the pay-go rate unless other revenue were found. Under Fund A, the cash flow becomes negative in 1984. Interest is first required from the provinces and the fund reaches its maximum in 1989.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures as a Percentage of Contributory Earnings, Using Most Probable Economic and Fertility Assumptions and Variations in Real Growth in Earnings, 1978-2050

Appendix D-8

Assumptions Economic:	Most probable	Most probable -.5 per cent	Most probable +.5 per cent
		(Per cent)	
1978	2.36	2.35	2.36
1980	2.86	2.87	2.85
1990	4.61	4.77	4.45
2000	5.73	6.01	5.47
2010	6.34	6.67	6.04
2020	8.08	8.49	6.84
2030	9.28	9.78	8.82
2040	8.87	9.41	8.38
2050	9.45	10.01	8.95

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan, Fund A,(a) with and without Earnings Test, Canada less Quebec

Appendix D-9

	Without earnings test	With earnings test
Year cash flow first negative	1986	1986
Year interest first required from provinces (maximum fund)	1992	1993
Year fund first becomes negative	2001	2003

a Contributions continue to be 3.6 per cent of contributory earnings.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures as a Percentage of Contributory Earnings, Fund B,(a) with and without Earnings Test, Canada Less Quebec, 1978-2050

Appendix D-10

	Without earnings test	With earnings test
Year cash flow first set to zero	1986	1986
Pay-go contributions in subsequent years, as percentage of contributory earnings		
1990	4.61	4.44
2000	5.73	5.55
2010	6.34	6.12
2020	8.08	7.76
2030	9.28	8.93
2040	8.87	8.62
2050	9.45	9.08
Fund as multiple of benefits		
1990	4.7	5.0
2000	3.8	4.0
2010	3.1	3.3
2020	2.4	2.6
2030	2.1	2.2
2040	2.1	2.3
2050	2.0	2.1

a Cash flow is not to be negative.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures as a Percentage of Contributory Earnings, Fund C,(a) with and without Earnings Test, Canada Less Quebec, 1978-2050

Appendix D-11

	Without earnings test	With earnings test
Year cash flow first negative	1986	1986
Year cash flow, when negative, equals fund interest (fund remains stable)	1992	1993
Pay-go contributions in subsequent years as a percentage of contributory earnings		
2000	5.07	4.83
2010	6.05	5.80
2020	7.92	7.59
2030	9.19	8.84
2040	8.83	8.57
2050	9.43	9.06
Fund as multiple of benefits		
2000	1.61	1.84
2010	.71	.81
2020	.30	.34
2030	.14	.16
2040	.08	.09
2050	.04	.04

a Cash flow not greater than interest when negative.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Entry Age Normal Costs, Allocation of Initial Assets and Unfunded Liabilities, with and without Earnings Test, Canada Less Quebec, 1980-2029

Entry age normal costs(a)	Without earnings test	With earnings test
	(Per cent)	
Retirement		
Non-indexed benefit	5.06	4.97
Indexing cost	2.09	1.97
Total	7.15	6.94
Welfare - non-indexed benefit		
Disability	.38	.38
Survivor	1.05	1.07
Total	1.43	1.45
Welfare - indexing cost		
Disability	.14	.14
Survivor	.84	.83
Total	.98	.97
Total		
Non-indexed benefit	6.49	6.41
Indexing cost	3.07	2.94
Total(a)	9.56	9.35
Initial funds	(Billions of dollars)	
Retirement	9.7	9.6
Welfare	2.9	3.0
Total	12.6	12.6

Unfunded liabilities and fifty-year liquidation costs(b)

	(Billions of dollars)	(Per cent)	(Billions of dollars)	(Per cent)
Retirement				
Non-indexed benefit	47.3	1.38	45.0	1.30
Indexing cost	23.7	.69	21.6	.62
Total	71.0	2.07	66.6	1.92
Welfare				
Non-indexed benefit	15.2	.44	15.1	.44
Indexing cost	12.4	.36	11.9	.34
Total	27.6	.80	27.0	.78
Total				
Non-indexed benefit	62.5	1.82	60.1	1.74
Indexing cost	36.1	1.05	33.5	.96
Total	98.5	2.87	93.6	2.70

a Excludes expenses which equal 1 per cent of contributory earnings.

b Contribution rate as percentage of contributory earnings required to liquidate unfunded liability over fifty-year period from 1980 to 2029.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Financial Effect of Baby Boom on Critical Years, Fund A,(a) Canada Less Quebec

Appendix D-13

	Total population	Excluding baby boom
Year cash flow first negative	1986	1984
Year interest first required from provinces (maximum fund)	1992	1989
Year fund first becomes negative	2001	1999

a Contributions continue to be 3.6 per cent of contributory earnings.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures as Percentages of Contributory Earnings, and the Fund as a Multiple of Expenditures, Fund B,(a) Including and Excluding the Baby Boom, Canada Less Quebec, and Ontario 1980-2050

Appendix D-14

	Canada less Quebec		Ontario	
	Total population	Excluding baby boom	Total population	Excluding baby boom
Year cash flow first set to zero	1986	1984	1985	1984
Pay-go contributions in subsequent years, as percentage of contributory earnings				
1990	4.61	4.96	4.84	5.18
2000	5.73	6.21	6.07	6.56
2010	6.34	6.94	6.67	7.27
2020	8.08	8.26	8.27	8.46
2030	9.28	8.90	9.25	8.88
2040	8.87	8.91	8.76	8.79
2050	9.45	9.34	9.35	9.24
Fund as multiple of benefits				
1990	4.7	4.4	4.8	4.6
2000	3.8	3.5	4.0	3.8
2010	3.1	3.0	3.5	3.3
2020	2.4	2.4	2.9	2.9
2030	2.1	2.2	2.6	2.8
2040	2.1	2.2	2.8	2.9
2050	2.0	2.1	2.7	2.8

a Cash flow is not to be negative.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures as Percentages of Contributory Earnings, and the Fund as a Multiple of Expenditures, Fund C,(a) Including and Excluding the Baby Boom, Canada Less Quebec, and Ontario

	Canada less Quebec		Ontario	
	Total population	Excluding baby boom	Total population	Excluding baby boom
Year cash flow first negative	1986	1984	1985	1984
Year cash flow, when negative, equals fund interest (fund remains stable)	1991	1989	1990	1989
			(Per cent)	
Pay-go contributions in subsequent years, as percentage of contributory earnings				
2000	5.07	6.21	6.07	6.56
2010	6.05	6.94	6.67	7.27
2020	7.92	8.26	8.27	8.46
2030	9.19	8.90	9.25	8.88
2040	8.83	8.91	8.76	8.79
2050	9.43	9.34	9.35	9.24
Fund as multiple of benefits				
2000	1.61	1.35	1.58	1.36
2010	.71	.60	.70	.61
2020	.30	.27	.30	.28
2030	.14	.13	.14	.14
2040	.08	.07	.08	.07
2050	.04	.03	.04	.04

a Cash flow not greater than interest when negative.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Stipulated Contribution Rates, Canada Less Quebec, 1978-2050
3.6% to 1985, 4% in 1985, increasing .2% or .3% annually to 8% in year 2000 and constant thereafter

	Benefits and expenses	Contribution rate	Contributions	Cash flow	Interest on loan	Loan	Fund	Fund as multiple of benefits
	(Millions of dollars)	(Per cent)		(Millions of dollars)			(Billions of dollars)	
1978	1,366	3.60	2,087	721	1,012	1,733	14.3	10.49
1979	1,727	3.60	2,370	644	1,163	1,807	16.1	9.34
1980	2,129	3.60	2,681	552	1,309	1,862	18.0	8.45
1981	2,537	3.60	3,035	498	1,455	1,953	20.0	7.86
1982	2,999	3.60	3,414	414	1,608	2,022	22.0	7.33
1983	3,476	3.60	3,814	338	1,766	2,105	24.1	6.93
1984	4,013	3.60	4,233	220	1,930	2,151	26.2	6.54
1985	4,615	4.00	5,185	570	2,105	2,676	28.9	6.26
1986	5,339	4.20	5,938	599	2,311	2,910	31.8	5.96
1987	6,131	4.40	6,755	624	2,544	3,168	35.0	5.71
1988	6,992	4.60	7,641	650	2,798	3,447	38.4	5.50
1989	7,915	4.80	8,603	689	3,066	3,755	42.2	5.33
1990	8,898	5.00	9,647	750	3,338	4,087	46.3	5.20
1991	9,897	5.30	10,963	1,066	3,592	4,659	50.9	5.15
1992	10,956	5.50	12,187	1,231	3,886	5,118	56.0	5.12
1993	12,082	5.80	13,765	1,683	4,212	5,895	61.9	5.13
1994	13,284	6.00	15,256	1,973	4,579	6,551	68.5	5.16
1995	14,562	6.30	17,172	2,610	4,980	7,590	76.1	5.22
1996	15,924	6.60	19,313	3,388	5,442	8,831	84.9	5.33
1997	17,378	6.90	21,689	4,311	5,982	10,293	95.2	5.48
1998	18,933	7.30	24,665	5,733	6,620	12,353	107.6	5.68
1999	20,600	7.60	27,616	7,016	7,390	14,406	122.0	5.92
2000	22,386	8.00	31,276	8,891	8,310	17,201	139.2	6.22

Canada Pension Plan, Stipulated Contribution Rates, Canada Less Quebec, 1978-2050
3.6% to 1985, 4% in 1985, increasing .2% or .3% annually to 8% in year 2000 and constant thereafter

	Benefits and expenses	Contribution rate	Contributions	Cash flow	Interest on loan	Loan	Fund	Fund as multiple of benefits
	(Millions of dollars)	(Per cent)		(Millions of dollars)			(Billions of dollars)	
2001	24,211	8.00	33,688	9,477	9,392	18,870	158.0	6.53
2002	26,192	8.00	36,282	10,090	10,581	20,671	178.7	6.82
2003	28,350	8.00	39,060	10,710	11,884	22,594	201.3	7.10
2004	30,717	8.00	42,027	11,310	13,308	24,618	225.9	7.35
2005	33,319	8.00	45,187	11,868	14,861	26,729	252.6	7.58
2006	36,143	8.00	48,546	12,402	16,547	28,949	281.6	7.79
2007	39,253	8.00	52,103	12,850	18,366	31,216	312.8	7.97
2008	42,691	8.00	55,863	13,172	20,321	33,493	346.3	8.11
2009	46,492	8.00	59,828	13,336	22,417	35,753	382.1	8.22
2010	50,716	8.00	64,001	13,284	24,664	37,948	420.0	8.28
2011	55,448	8.00	68,317	12,868	27,086	39,955	460.0	8.30
2012	60,573	8.00	72,863	12,291	29,634	41,925	501.9	8.29
2013	66,197	8.00	77,660	11,463	32,304	43,767	545.7	8.24
2014	72,344	8.00	82,727	10,382	35,088	45,470	591.1	8.17
2015	79,026	8.00	88,083	9,057	37,977	47,033	638.2	8.08
2016	86,209	8.00	93,689	7,480	40,962	48,442	686.6	7.96
2017	93,979	8.00	99,639	5,659	44,033	49,692	736.3	7.83
2018	102,353	8.00	105,967	3,614	47,180	50,794	787.1	7.69
2019	111,361	8.00	112,710	1,349	50,395	51,744	838.8	7.53
2020	121,027	8.00	119,901	-1,127	53,667	52,540	891.4	7.37
2021	131,451	8.00	127,538	-3,912	56,985	53,073	944.4	7.18
2022	142,627	8.00	135,703	-6,924	60,333	53,409	997.9	7.00
2023	154,555	8.00	144,439	-10,116	63,701	53,585	1,051.4	6.80
2024	167,264	8.00	153,789	-13,475	67,076	53,601	1,105.0	6.61
2025	180,761	8.00	163,797	-16,965	70,450	53,485	1,158.5	6.41

Canada Pension Plan, Stipulated Contribution Rates, Canada Less Quebec, 1978-2050
3.6% to 1985, 4% in 1985, increasing .2% or .3% annually to 8% in year 2000 and constant thereafter

	Benefits and expenses	Contribution rate	Contributions	Cash flow	Interest on loan	Loan	Fund	Fund as multiple of benefits
	(Millions of dollars)	(Per cent)		(Millions of dollars)			(Billions of dollars)	
2026	195,413	8.00	174,421	-20,992	73,809	52,817	1,211.3	6.20
2027	210,839	8.00	185,813	-25,027	77,124	52,097	1,263.4	5.99
2028	226,952	8.00	198,036	-28,916	80,397	51,481	1,314.9	5.79
2029	243,730	8.00	211,155	-32,576	83,633	51,057	1,366.0	5.60
2030	261,136	8.00	225,236	-35,900	86,847	50,947	1,416.9	5.43
2031	278,595	8.00	240,395	-38,200	90,071	51,871	1,468.8	5.27
2032	296,761	8.00	256,633	-40,128	93,360	53,232	1,522.0	5.13
2033	315,758	8.00	274,000	-41,758	96,741	54,983	1,577.0	4.99
2034	335,620	8.00	292,547	-43,073	100,239	57,166	1,634.2	4.87
2035	356,399	8.00	312,327	-44,071	103,880	59,809	1,694.0	4.75
2036	377,503	8.00	333,368	-44,135	107,709	63,574	1,757.6	4.66
2037	399,975	8.00	355,749	-44,226	111,775	67,549	1,825.1	4.56
2038	424,134	8.00	379,529	-44,605	116,093	71,488	1,896.6	4.47
2039	450,241	8.00	404,764	-45,477	120,654	75,177	1,971.8	4.38
2040	478,507	8.00	431,513	-46,995	125,441	78,446	2,050.2	4.28
2041	508,784	8.00	459,657	-49,127	130,427	81,300	2,131.5	4.19
2042	541,791	8.00	489,472	-52,319	135,579	83,260	2,214.8	4.09
2043	577,884	8.00	521,058	-56,826	140,835	84,009	2,298.8	3.98
2044	617,405	8.00	554,514	-62,891	146,114	83,223	2,382.0	3.86
2045	660,694	8.00	589,942	-70,752	151,316	80,564	2,462.6	3.73
2046	708,083	8.00	627,440	-80,643	156,314	75,671	2,538.2	3.58
2047	759,921	8.00	667,111	-92,811	160,962	68,151	2,606.4	3.43
2048	816,547	8.00	709,054	-107,493	165,088	57,595	2,664.0	3.26
2049	878,286	8.00	753,368	-124,918	168,495	43,577	2,707.6	3.08
2050	945,465	8.00	800,157	-145,309	170,958	25,649	2,733.2	2.89

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

APPENDIX E - COMPARISON OF ROYAL COMMISSION PROJECTIONS WITH STATUTORY ACTUARIAL REPORT NO. 6 ON THE CANADA PENSION PLAN AS AT DECEMBER 31, 1977

Appendix E-1	Comparison of Economic, Fertility and Immigration Assumptions of the Department of Insurance and the Royal Commission	298
E-2	Comparison of the Department of Insurance and the Royal Commission Projections of CPP Expenditures, Expressed as Percentages of Contributory Earnings	299
E-3	Comparison of Various Items Developed by the Department of Insurance and the Royal Commission for CPP Financial Projections	300
E-4	Fund C as Developed By the Royal Commission, Using Alternative Assumptions, Canada less Quebec, Four Fertility Assumptions and Three Economic Assumptions, Selected Years	301
E-5	Comparison of Fund C developed by the Royal Commission on its Most Probable Assumptions, with Various Alternatives Developed by the Department of Insurance	302

Canada Pension Plan, Comparison of Economic, Fertility and Immigration/Emigration Assumptions Used by Department of Insurance and Royal Commission for Financial Projections, Canada Less Quebec, 1978-2000 and Beyond

	Department of Insurance		Royal Commission				
	1978	1983 and later	1978	1979	1980-84	1985-89	1990 and later
			(Per cent)				
Economic assumptions							
Investment rate of return	9.4	6.5	9.0	8.3	7.9	7.6	6.4
Average earnings growth	6.7	5.5	7.0	8.0	7.3	7.0	6.1
Inflation	9.0	3.5	7.3	6.0	5.5	5.0	4.0
Growth in real wages	-2.3	2.0	-.3	2.0	1.8	2.0	2.1
Real investment return	.4	3.0	1.7	2.3	2.4	2.6	2.4

	1974	1985 and later	1974	1985	1990	1995 and later
Fertility assumptions						
Net reproduction rate	.89	1.00	.89	1.20	1.10	1.00
Total fertility rate	1.87	2.112	1.87	2.50	2.25	2.06

	Immigration	Emigration	Immigration	Emigration
Immigration/emigration				
Initial level	160,000 (1971)	60,000 (1971)	100,000 (1978)	40,000 (1978)
Annual rate of increase applicable to initial level	1.5% (1971-95)	1.5% (1971-95)	.5% (1978-2000)	.5% (1978-2000)
	1.0% (1995-2025)	1.0% (1995-2025)	— (2000 & later)	— (2000 & later)
	.8% (2025 & later)	.8% (2025 & later)		

	1971	2000 and later	All years
Migration			
Immigration to Quebec(a)	17.33%	25%	15%
Emigration from Quebec(a)	29.84%	25%	25%
Net immigration Quebec to rest of Canada	22,017	—	20,000 in 1978 grading to 5,000 in 2000 and later

a Expressed as a percentage of total Canadian immigration and emigration, respectively.

Source Department of Insurance, "Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977," and data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Department of Insurance and Royal Commission Projections of Expenditures as a Percentage of Contributory Earnings, Canada Less Quebec, 1978-2050

Appendix E-2

	Department of Insurance	Royal Commission	Ratio of column 2 to column 1
	(1)	(2)	(3)
		(Per cent)	
1978	2.38	2.36	.992
1980	2.90	2.86	.986
1990	4.57	4.61	1.009
2000	5.53	5.73	1.036
2010	6.20	6.34	1.023
2025	8.62	8.83	1.024
2030	9.09	9.28	1.021
2050	8.76	9.45	1.079

Source Department of Insurance, "Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977," and data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Financial Projections by Department of Insurance and the Royal Commission, Various Items, Canada Less Quebec, 1980-2050

Appendix E-3

	Royal Commission	Department of Insurance	Ratio of Column 1 to Column 2
	(1)	(2)	(3)
Population - males		(Thousands)	
1980	9,165	9,128	1.004
2000	11,861	12,052	.984
2025	14,498	15,464	.938
2050	16,321	18,743	.871
Population - females			
1980	9,146	9,103	1.005
2000	11,987	12,156	.986
2025	14,884	15,794	.942
2050	16,915	19,251	.879
Projected expenditures		(Billions of dollars)	
1978	1.4	1.4	1.00
2000	22.4	18.4	1.22
2025	180.8	135.6	1.33
2050	945.5	636.2	1.49
Pay-go contributions		(Percentage of contributory earnings)	
1978	2.36	2.38	.992
2000	5.73	5.53	1.036
2025	8.83	8.62	1.024
2050	9.45	8.76	1.079
Entry age normal costs	9.50	8.04	1.18
Unfunded actuarial liability, December 31, 1977	98.5	(Billions of dollars) 81.3	1.21

Source Department of Insurance, "Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977," and data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan Projections of Fund C (Cash Flow Not Greater Than Interest When Negative), Developed by the Royal Commission, Using Alternative Economic and Fertility Assumptions, Canada Less Quebec, 1986-2050

Appendix E-4

Assumptions						
Economic:	Most probable				Low	High
Fertility:	Most probable	Low/Low	Low	High	Most probable	Most probable
Year cash flow first negative	1986	1986	1986	1986	1985	1986
Year cash flow, when negative, equals fund interest (fund remains stable)	1991	1991	1991	1991	1991	1992
Pay-go contributions in subsequent years, as percentage of earnings						
2000	5.07	5.14	5.12	5.01	5.12	4.95
2010	6.05	6.48	6.31	5.72	6.07	6.02
2025	8.72	9.75	9.16	8.04	8.74	8.70
2030	9.19	10.53	9.74	8.41	9.21	9.17
2050	9.43	10.58	9.48	9.11	9.48	9.33
Fund as multiple of benefits in current year						
2000	1.61	1.62	1.62	1.60	1.84	1.27
2010	.71	.72	.72	.71	.89	.46
2025	.20	.20	.20	.20	.29	.10
2030	.14	.14	.14	.14	.21	.06
2050	.04	.04	.04	.04	.07	.01

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan Comparison of Fund C (Cash Flow Not Greater Than Interest When Negative), Developed by Royal Commission, with Various Alternatives Developed by the Department of Insurance, Canada Less Quebec, 2000-2050

Appendix E-5

Assumptions:	Royal Commission	Department of Insurance Table References(a)						
		Table 1	Table 5	Table 6	Table 7	Table 8	Table 9	Table 10
					(Per cent)			
Earnings		5.5	5.5	6.0	6.5	5.5	5.5	5.5
Inflation	Most	3.5	4.0	3.5	4.5	3.5	3.5	4.0
Investment		6.5	6.5	6.5	7.5	6.5	6.5	6.5
Fertility (NRR)	probable	1.00	1.00	1.00	1.00	1.00	.85	.85
Net immigration (as percentage of current population)		.465	.465	.465	.465	100,000	.465	100,000
Year cash flow, when negative, equals fund interest (fund remains stable)	1991	1992	1991	1991	1992	1992	1992	1990
Pay-go contributions in subsequent years, as percentage of earnings								
2000	5.07	4.84	5.11	4.91	4.80	4.98	4.87	5.28
2010	6.05	5.85	6.16	5.88	5.84	6.08	6.06	6.66
2025	8.72	8.48	8.91	8.49	8.46	9.01	9.23	10.38
2030	9.19	8.98	9.45	8.99	8.95	9.61	9.98	11.36
2050	9.43	8.73	9.23	8.74	8.69	9.45	10.03	11.76
Fund as multiple of benefits in current year								
2000	1.61	1.89	1.73	1.84	1.66	1.86	1.90	1.72
2010	.71	.87	.79	.85	.70	.87	.88	.80
2025	.20	.26	.23	.25	.18	.26	.26	.24
2030	.14	.18	.16	.17	.12	.18	.18	.17
2050	.04	.05	.05	.05	.03	.06	.06	.06

a These tables can be found in the Department of Insurance, "Statutory Actuarial Report No. 6."

Source Department of Insurance, "Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977," and data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's most probable fertility and economic assumptions.

APPENDIX F - OLD AGE SECURITY, GUARANTEED INCOME SUPPLEMENT AND SPOUSE'S ALLOWANCE PROJECTED EXPENDITURES

(All based on the Royal Commission's most probable fertility, immigration and economic assumptions)

Appendix F-1 OAS Expenditures Projected for Canada, 1979-2050, Selected Years, in Millions of Dollars, Percentage of GNP, and Percentage of CPP/QPP Contributory Earnings 304

F-2 OAS Expenditures Projected for Canada Less Quebec, 1979 -2050, Selected Years, in Millions of Dollars, Percentage of GNP, and Percentage of CPP Contributory Earnings 305

F-3 OAS Expenditures Projected for Ontario 1979-2050, Selected Years, in Millions of Dollars, Percentage of Gross Provincial Product, and Percentage of Ontario's CPP Contributory Earnings 306

F-4 Guaranteed Income Supplement and Spouse's Allowance Expenditures Projected for Canada, 1979-2050, Selected Years, in Millions of Dollars, Percentage of GNP, and Percentage of CPP/QPP Contributory Earnings 307

F-5 Guaranteed Income Supplement and Spouse's Allowance Expenditures Projected for Canada Less Quebec, 1979-2050, Selected Years, in Millions of Dollars, Percentage of GNP, and Percentage of CPP Contributory Earnings 308

F-6 Guaranteed Income Supplement and Spouse's Allowance Expenditures Projected for Ontario, 1979-2050, Selected Years, in Millions of Dollars, Percentage of Gross Provincial Product, and Percentage of Ontario's CPP Contributory Earnings 309

Projected Expenditures for Old Age Security, Canada, 1979-2050 Appendix F-1

	Millions of dollars			Percentage of GNP			Percentage of CPP/QPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully Indexed
1979	4,299	4,315	4,403	1.68	1.68	1.72	4.98	5.00	5.10
1980	4,420	4,456	4,794	1.58	1.59	1.71	4.55	4.59	4.93
1985	4,941	5,355	6,992	1.13	1.23	1.60	2.98	3.23	4.22
1990	5,623	7,322	10,113	.88	1.15	1.59	2.30	3.00	4.14
1995	6,191	9,694	13,558	.69	1.09	1.52	1.80	2.82	3.95
2000	6,626	12,535	17,655	.52	.98	1.38	1.35	2.56	3.60
2005	6,988	15,994	22,654	.38	.87	1.23	.99	2.27	3.22
2010	7,724	21,844	30,467	.30	.84	1.17	.78	2.21	3.08
2015	8,985	31,478	43,120	.25	.88	1.21	.66	2.32	3.18
2020	10,423	44,547	60,857	.22	.93	1.27	.57	2.42	3.31
2025	11,891	61,322	84,465	.18	.94	1.30	.48	2.46	3.39
2030	13,099	80,829	113,207	.15	.91	1.28	.38	2.37	3.32
2035	13,380	97,346	140,674	.11	.80	1.15	.28	2.06	2.98
2040	13,224	114,352	169,161	.08	.67	.99	.20	1.76	2.60
2045	13,514	143,028	210,335	.06	.62	.91	.15	1.61	2.37
2050	14,565	191,966	275,814	.05	.61	.88	.12	1.60	2.30

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Projected Expenditures for Old Age Security, Canada less Quebec, 1979-2050

Appendix F-2

	Millions of dollars			Percentage of GNP			Percentage of CPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully Indexed
1979	3,228	3,241	3,306	1.66	1.67	1.70	4.90	4.92	5.02
1980	3,317	3,344	3,597	1.54	1.55	1.67	4.45	4.49	4.83
1985	3,690	3,999	5,221	1.10	1.19	1.55	2.85	3.09	4.03
1990	4,184	5,448	7,526	.84	1.09	1.51	2.17	2.82	3.90
1995	4,580	7,172	10,031	.65	1.02	1.42	1.68	2.63	3.68
2000	4,881	9,234	13,006	.48	.91	1.28	1.25	2.36	3.33
2005	5,147	11,781	16,687	.35	.80	1.13	.91	2.08	2.95
2010	5,681	16,065	22,407	.27	.77	1.07	.71	2.01	2.80
2015	6,645	23,279	31,889	.23	.81	1.11	.60	2.12	2.90
2020	7,740	33,082	45,194	.20	.85	1.16	.52	2.21	3.02
2025	8,856	45,672	62,910	.17	.86	1.18	.43	2.23	3.07
2030	9,812	60,544	84,796	.13	.83	1.16	.35	2.15	3.01
2035	10,130	73,708	106,514	.10	.73	1.05	.26	1.89	2.73
2040	10,171	87,952	130,107	.07	.63	.93	.19	1.63	2.41
2045	10,486	110,975	163,199	.05	.58	.85	.14	1.50	2.21
2050	11,296	148,879	213,907	.04	.57	.82	.11	1.49	2.14

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Projected Expenditures for Old Age Security, Ontario, 1979-2050

Appendix F-3

	Millions of dollars			Percentage of GPP (Ontario)			Percentage of Ontario's CPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully Indexed
1979	1,572	1,578	1,610	1.56	1.57	1.59	4.69	4.71	4.81
1980	1,614	1,628	1,751	1.45	1.46	1.58	4.27	4.30	4.63
1985	1,793	1,943	2,537	1.04	1.13	1.47	2.74	2.96	3.87
1990	2,069	2,694	3,722	.82	1.06	1.47	2.14	2.78	3.84
1995	2,302	3,605	5,042	.64	1.01	1.41	1.69	2.65	3.70
2000	2,477	4,686	6,600	.48	.92	1.29	1.27	2.40	3.38
2005	2,623	6,003	8,503	.35	.81	1.15	.93	2.13	3.02
2010	2,895	8,187	11,419	.28	.78	1.09	.73	2.05	2.86
2015	3,375	11,824	16,197	.23	.82	1.13	.62	2.15	2.95
2020	3,865	16,520	22,569	.20	.84	1.15	.52	2.21	3.02
2025	4,357	22,469	30,949	.16	.83	1.15	.43	2.19	3.02
2030	4,795	29,591	41,444	.13	.80	1.12	.34	2.10	2.94
2035	4,929	35,866	51,830	.10	.70	1.01	.25	1.83	2.64
2040	4,950	42,810	63,329	.07	.60	.89	.18	1.58	2.33
2045	5,114	54,124	79,595	.05	.56	.82	.14	1.46	2.14
2050	5,528	72,859	104,683	.04	.55	.79	.11	1.44	2.07

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Projected Expenditures for Guaranteed Income Supplement and the Spouse's Allowance, Canada, 1979-2050 Appendix F-4

	Millions of dollars			Percentage of GNP			Percentage of CPP/QPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully Indexed
1979	1,535	1,540	1,627	.60	.60	.64	1.78	1.78	1.88
1980	1,553	1,565	1,736	.55	.56	.62	1.60	1.61	1.79
1985	1,618	1,803	2,354	.37	.41	.54	.98	1.09	1.42
1990	1,710	2,277	3,145	.27	.36	.49	.70	.93	1.29
1995	1,822	2,914	4,076	.20	.33	.46	.53	.85	1.19
2000	1,906	3,683	5,188	.15	.29	.41	.39	.75	1.06
2005	1,968	4,598	6,513	.11	.25	.35	.28	.65	.93
2010	2,129	6,145	8,571	.08	.24	.33	.22	.62	.87
2015	2,415	8,637	11,832	.07	.24	.33	.18	.64	.87
2020	2,730	11,914	16,276	.06	.24	.34	.15	.65	.89
2025	3,031	15,961	21,986	.05	.25	.34	.12	.64	.88
2030	3,254	20,500	28,712	.04	.23	.32	.10	.60	.84
2035	3,240	24,067	34,779	.03	.19	.28	.07	.51	.74
2040	3,124	27,580	40,800	.02	.16	.24	.05	.42	.63
2045	3,115	33,660	49,500	.01	.14	.21	.04	.38	.56
2050	3,270	44,010	63,234	.01	.14	.20	.03	.37	.53

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Projected Expenditures for Guaranteed Income Supplement and the Spouse's Allowance, Canada less Quebec, 1979-2050 Appendix F-5

	Millions of dollars			Percentage of GNP			Percentage of CPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully Indexed
1979	1,086	1,090	1,151	.56	.56	.59	1.65	1.66	1.75
1980	1,097	1,105	1,226	.51	.51	.57	1.47	1.48	1.65
1985	1,141	1,271	1,660	.34	.38	.49	.88	.98	1.28
1990	1,205	1,605	2,217	.24	.32	.45	.62	.83	1.15
1995	1,280	2,047	2,863	.18	.29	.41	.47	.75	1.05
2000	1,338	2,585	3,641	.13	.25	.36	.34	.66	.93
2005	1,382	3,230	4,575	.09	.22	.31	.24	.57	.81
2010	1,492	4,307	6,007	.07	.21	.29	.19	.54	.75
2015	1,700	6,082	8,332	.06	.21	.29	.15	.55	.76
2020	1,925	8,398	11,473	.05	.22	.29	.13	.56	.77
2025	2,140	11,270	15,524	.04	.21	.29	.10	.55	.76
2030	2,308	14,541	20,366	.03	.20	.28	.08	.52	.72
2035	2,320	17,238	24,911	.02	.17	.25	.06	.44	.64
2040	2,273	20,070	29,690	.02	.14	.21	.04	.37	.55
2045	2,285	24,696	36,319	.01	.13	.19	.03	.33	.49
2050	2,397	32,259	46,350	.01	.12	.18	.02	.32	.46

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Projected Expenditures for Guaranteed Income Supplement and the Spouse's Allowance, Ontario, 1979-2050

Appendix F-6

	Millions of dollars			Percentage of GPP (Ontario)			Percentage of Ontario's CPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully Indexed
1979	451	452	478	.45	.45	.47	1.35	1.35	1.43
1980	456	460	510	.41	.41	.46	1.21	1.22	1.35
1985	473	527	688	.27	.30	.40	.72	.80	1.05
1990	508	676	934	.20	.27	.37	.52	.70	.96
1995	548	875	1,225	.15	.25	.34	.40	.64	.90
2000	577	1,114	1,570	.11	.22	.31	.30	.57	.80
2005	599	1,400	1,983	.08	.19	.27	.21	.50	.70
2010	647	1,868	2,606	.06	.18	.25	.16	.47	.65
2015	736	2,631	3,605	.05	.18	.25	.12	.48	.66
2020	821	3,583	4,896	.04	.18	.25	.11	.48	.65
2025	899	4,735	6,522	.03	.18	.24	.09	.46	.64
2030	965	6,078	8,513	.03	.16	.23	.07	.43	.60
2035	966	7,174	10,368	.02	.14	.20	.05	.37	.53
2040	947	8,360	12,368	.01	.12	.17	.03	.31	.45
2045	954	10,314	15,168	.01	.11	.16	.03	.28	.41
2050	1,004	13,507	19,407	.01	.10	.15	.02	.27	.38

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

APPENDIX G - SELECTED CANADA PENSION PLAN PROJECTIONS, CANADA LESS QUEBEC

(Based on the Royal Commission's high economic and low/low fertility assumptions.)

Appendix G-1	Comparison of Expenditures in Millions of Dollars and as a Percentage of Contributory Earnings (see Appendix C-7 for comparison)	312
G-2	Comparison of Entry Age Normal Costs, Unfunded Liabilities and Fifty-year Amortization Percentages of Unfunded Liabilities, Various Assumptions, Canada less Quebec, 1980-2029	313
G-3	Benefits and Expenses, Contributions, Cash Flow, Interest and Fund Size for Funds A, B, and C with Contribution Rates for Funds B and C, Annually 1978 to 2050 (see Appendix D-3 for comparison)	314
G-4	Benefits and Expenses, Contributions, Cash Flow, Interest and Fund Size for Funds D, E, and F with Contributions Rates for Fund D - Entry Age Normal Funding Fund E - Retirement Benefits Entry Age Normal, Balance Pay-go Fund F - Non-indexed Retirement Benefits Entry Age Normal, Balance Pay-go Annually, 1978 to 2050 (see Appendix D-4 for comparison)	317
G-5	Financial Effect of Baby Boom on Critical Years, Fund A (see Appendix D-14 for comparison)	320
G-6	Comparison of Expenditures as Percentages of Contributory Earnings and Fund as a Multiple of Expenditures, Including and Excluding the Baby Boom Population, Fund B, Canada less Quebec (see Appendix D-15 for comparison)	321

G-7 Comparison of Expenditures as Percentages of Contributory Earnings and Fund as a Multiple of Expenditures, Including and Excluding the Baby Boom Population, Fund C, Canada less Quebec (see Appendix D-16 for comparison) 322

G-8 OAS Expenditures Projected for Canada, 1979-2050, Selected Years in Millions of Dollars, Percentage of GNP, and Percentage of CPP/QPP Contributory Earnings 323

G-9 Guaranteed Income Supplement and Spouse's Allowance Expenditures Projected for Canada, 1979-2050, Selected Years in Millions of Dollars, Percentage of GNP, and Percentage of CPP/QPP Contributory Earnings 324

Canada Pension Plan Comparison of Expenditures in Millions of Dollars and as a Percentage of Contributory Earnings, Based on Low/Low Fertility Assumptions, Together with High Economic Assumptions, Canada less Quebec, 1978-2050

Appendix G-1

	High economic and low/low fertility				
	Expenditures in millions of dollars		Percentage of contributory earnings		
	Contributory earnings	Total expenditures	Non-indexed benefit	Indexing cost	Total
1978	58,370	1,382	2.10	.27	2.37
1979	66,746	1,764	2.25	.39	2.64
1980	76,169	2,198	2.37	.52	2.89
1981	86,599	2,640	2.41	.64	3.05
1982	98,235	3,153	2.45	.76	3.21
1983	111,170	3,700	2.47	.86	3.33
1984	125,496	4,332	2.50	.96	3.45
1985	141,308	5,060	2.53	1.05	3.58
1986	159,419	5,934	2.58	1.14	3.72
1987	179,019	6,922	2.65	1.22	3.87
1988	200,021	8,032	2.72	1.30	4.02
1989	222,336	9,267	2.80	1.37	4.17
1990	245,876	10,632	2.89	1.43	4.32
1995	378,878	19,481	3.37	1.77	5.14
2000	586,436	33,297	3.62	2.06	5.68
2010	1,373,794	92,215	4.19	2.52	6.71
2020	3,018,227	265,921	5.58	3.23	8.81
2030	6,533,550	689,639	6.48	4.08	10.56
2040	14,463,858	1,504,361	6.02	4.38	10.40
2050	31,643,408	3,316,009	6.16	4.32	10.48

Expenses are "non-indexed"

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan, Comparison of Entry Age Normal Costs, Unfunded Liabilities, and Fifty-year Amortization Percentages of Unfunded Liabilities, Various Assumptions, Canada less Quebec, 1980-2029

Assumptions:	Most probable				Low	High	High
Economic:	Most				Most	Most	
Fertility:	probable	Low/low	Low	High	probable	probable	Low/low
Entry age normal costs							
Retirement							
Non-indexed benefit	5.06	5.06	5.06	5.06	5.47	5.40	4.40
Indexing cost	2.09	2.09	2.09	2.09	1.67	2.79	2.79
Total	7.15	7.15	7.15	7.15	7.14	7.19	7.19
Welfare - non-indexed benefit							
Disability	.38	.38	.38	.38	.40	.34	.34
Survivor	1.05	1.05	1.04	1.05	1.18	.85	.85
Total	1.43	1.43	1.42	1.43	1.58	1.19	1.19
Welfare - indexing cost							
Disability	.14	.14	.14	.14	.12	.18	.17
Survivor	.84	.83	.83	.84	.70	1.04	1.04
Total	.98	.97	.97	.98	.82	1.22	1.21
Total							
Non-indexed benefit	6.49	6.49	6.48	6.49	7.05	4.92	4.91
Indexing cost	3.07	3.06	3.06	3.07	2.49	4.68	4.68
Total(a)	9.56	9.55	9.54	9.56	9.54	9.60	9.59
Unfunded liabilities and fifty-year liquidation percentages(b)							
	($B) (%)	($B) (%)	($B) (%)	($B) (%)	($B) (%)	($B) (%)	($B) (%)
Retirement							
Non-indexed benefit	47.3 1.38	47.3 1.45	47.3 1.42	47.3 1.32	49.2 1.48	44.5 1.20	44.5 1.27
Indexing cost	23.7 .69	23.7 .73	23.7 .71	23.7 .66	18.8 .57	33.1 .90	33.1 .95
Total	71.0 2.07	70.9 2.18	70.9 2.13	71.0 1.98	68.0 2.05	77.5 2.10	77.6 2.22
Welfare							
Non-indexed benefit	15.2 .44	15.2 .47	15.2 .45	15.2 .42	16.3 .49	13.6 .37	13.5 .39
Indexing cost	12.4 .36	12.3 .37	12.3 .37	12.4 .35	10.1 .31	16.4 .44	16.4 .47
Total	27.5 .80	27.5 .84	27.5 .82	27.6 .77	26.5 .80	30.0 .81	29.9 .86
Total							
Non-indexed benefit	62.5 1.82	62.5 1.92	62.5 1.87	62.5 1.74	65.5 1.97	58.1 1.57	58.0 1.66
Indexing cost	36.1 1.05	36.0 1.11	36.0 1.01	36.1 1.01	28.9 .88	49.5 1.34	49.5 1.42
Total	98.5 2.87	98.4 3.02	98.4 2.95	98.5 2.75	94.4 2.85	107.5 2.91	107.5 3.08

a Excludes expenses which equal 1 per cent of contributory earnings. Costs are expressed as a percentage of contributory earnings.

b Contribution rates as a percentage of contributory earnings required to liquidate unfunded liability over fifty-year period from 1980-2029.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan, All Benefits and Expenses, Canada less Quebec, 1978-2050
High Economic; Low/Low Fertility

		Fund A 3.6% contribution rate				Fund B Cash flow not negative					Fund C Cash flow not greater than interest when negative				
	Benefits and expenses	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund
	($M)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
1978	1382	2101	719	1018	14.3	3.60	2101	719	1018	14.3	3.60	2101	719	1018	14.3
1979	1764	2403	639	1196	16.2	3.60	2403	639	1196	16.2	3.60	2403	639	1196	16.2
1980	2198	2742	544	1373	18.1	3.60	2742	544	1373	18.1	3.60	2742	544	1373	18.1
1981	2640	3118	478	1562	20.1	3.60	3118	478	1562	20.1	3.60	3118	478	1562	20.1
1982	3153	3536	383	1761	22.3	3.60	3536	383	1761	22.3	3.60	3536	383	1761	22.3
1983	3700	4002	302	1971	24.5	3.60	4002	302	1971	24.5	3.60	4002	302	1971	24.5
1984	4332	4518	186	2194	26.9	3.60	4518	186	2194	26.9	3.60	4518	186	2194	26.9
1985	5060	5087	27	2424	29.4	3.60	5087	27	2424	29.4	3.60	5087	27	2424	29.4
1986	5934	5739	-194	2658	31.8	3.72	5934	0	2663	32.0	3.60	5739	-194	2658	31.8
1987	6922	6445	-476	2908	34.3	3.87	6922	0	2939	35.0	3.60	6445	-476	2908	34.3
1988	8032	7201	-830	3161	36.6	4.02	8032	0	3249	38.2	3.60	7201	-830	3161	36.6
1989	9267	8004	-1262	3395	38.7	4.17	9267	0	3581	41.8	3.60	8004	-1262	3395	38.7
1990	10632	8852	-1779	3596	40.5	4.32	10632	0	3927	45.7	3.60	8852	-1779	3596	40.5
1991	12090	9674	-2415	3740	41.9	4.50	12090	0	4263	50.0	3.60	9674	-2415	3740	41.9
1992	13690	10551	-3138	3848	42.6	4.67	13690	0	4633	54.6	3.60	10551	-3138	3848	42.6
1993	15446	11495	-3950	3901	42.5	4.84	15446	0	5032	59.7	3.59	11455	-3990	3991	42.6
1994	17373	12520	-4852	3885	41.6	5.00	17373	0	5462	65.1	3.85	13382	-3990	3991	42.6
1995	19481	13640	-5840	3781	39.5	5.14	19481	0	5919	71.0	4.09	15496	-3984	3985	42.6
1996	21759	14878	-6880	3579	36.2	5.27	21759	0	6409	77.4	4.30	17784	-3974	3975	42.6
1997	24255	16234	-8020	3268	31.4	5.38	24255	0	6938	84.4	4.50	20290	-3964	3965	42.6
1998	26992	17718	-9273	2818	25.0	5.48	26992	0	7504	91.9	4.69	23062	-3929	3930	42.6
1999	30000	19340	-10659	2169	16.5	5.58	30000	0	8102	100.0	4.86	26095	-3904	3905	42.6
2000	33297	21112	-12184	1310	5.6	5.68	33297	0	8756	108.7	5.02	29420	-3876	3877	42.6

		Fund A 3.6% contribution rate				Fund B Cash flow not negative					Fund C Cash flow not greater than interest when negative				
	Benefits and expenses	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund
	($M)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
2001	36733	23037	-13696	231	-7.8	5.74	36733	0	9464	118.2	5.14	32887	-3846	3847	42.6
2002	40552	25133	-15418	-981	-24.2	5.81	40552	0	10228	128.4	5.26	36736	-3814	3815	42.6
2003	44807	27412	-17394	-2401	-44.0	5.88	44807	0	11055	139.5	5.39	41025	-3781	3782	42.6
2004	49569	29884	-19683	-4112	-67.8	5.97	49569	0	11950	151.4	5.52	45822	-3746	3747	42.6
2005	54902	32563	-22338	-6166	-96.3	6.07	54902	0	12921	164.4	5.66	51184	-3717	3718	42.6
2006	60703	35446	-25256	-8622	-130.2	6.17	60703	0	13976	178.3	5.79	57019	-3683	3684	42.6
2007	67221	38562	-28658	-11540	-170.4	6.28	67221	0	15112	193.5	5.94	63574	-3646	3647	42.6
2008	74570	41925	-32644	-15000	-218.1	6.40	74570	0	16337	209.8	6.09	70959	-3610	3611	42.6
2009	82851	45552	-37298	-19100	-274.5	6.55	82851	0	17661	227.5	6.27	79274	-3576	3577	42.6
2010	92215	49457	-42757	-23952	-341.2	6.71	92215	0	19106	246.6	6.45	88638	-3576	3577	42.6
2011	102737	53606	-49131	-29690	-420.0	6.90	102737	0	20711	267.3	6.66	99161	-3576	3577	42.6
2012	114385	58076	-56308	-36462	-512.8	7.09	114385	0	22451	289.7	6.87	110808	-3576	3577	42.6
2013	127424	62893	-64529	-44427	-621.7	7.29	127424	0	24336	314.1	7.09	123847	-3576	3577	42.6
2014	141964	68086	-73876	-53776	-749.4	7.51	141964	0	26381	340.4	7.32	138387	-3576	3577	42.6
2015	158092	73682	-84409	-64720	-898.5	7.72	158092	0	28597	369.0	7.55	154516	-3576	3577	42.6
2016	175677	79646	-96030	-77489	-1072.0	7.94	175677	0	30999	400.0	7.78	172100	-3576	3577	42.6
2017	195117	86083	-109033	-92339	-1273.4	8.16	195117	0	33603	433.6	8.01	191540	-3576	3577	42.6
2018	216535	93035	-123500	-109559	-1506.5	8.38	216535	0	36426	470.1	8.24	212959	-3576	3577	42.6
2019	240089	100545	-139543	-129472	-1775.5	8.60	240089	0	39485	509.5	8.47	236513	-3575	3576	42.6
2020	265921	108656	-157264	-152442	-2085.2	8.81	265921	0	42802	552.4	8.69	262345	-3575	3576	42.6
2021	294170	117315	-176854	-178869	-2440.9	9.03	294170	0	46397	598.7	8.92	290593	-3576	3577	42.6
2022	325121	126684	-198436	-209203	-2848.6	9.24	325121	0	50295	649.0	9.14	321545	-3575	3576	42.6
2023	358896	136830	-222065	-243941	-3314.6	9.44	358896	0	54520	703.6	9.35	355319	-3576	3577	42.6
2024	395693	147819	-247872	-283628	-3846.1	9.64	395693	0	59099	762.7	9.55	392116	-3575	3576	42.6
2025	435650	159719	-275930	-328859	-4450.9	9.82	435650	0	64063	826.7	9.74	432073	-3575	3576	42.6

		Fund A 3.6% contribution rate				Fund B Cash flow not negative					Fund C Cash flow not greater than interest when negative				
	Benefits and expenses	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund	Contribution rate	Contributions	Cash flow	Interest	Fund
	($M)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
2026	479804	172396	-307407	-380329	-5138.6	10.02	479804	0	69445	896.2	9.94	476227	-3575	3576	42.6
2027	527318	186166	-341152	-438807	-5918.6	10.20	527318	0	75278	971.4	10.13	523742	-3575	3576	42.6
2028	578091	201147	-376943	-505070	-6800.6	10.35	578091	0	81601	1053.0	10.28	574515	-3575	3576	42.6
2029	632191	217455	-414734	-579959	-7795.3	10.47	632191	0	88455	1141.5	10.41	628614	-3575	3576	42.6
2030	689639	235208	-454430	-664345	-8914.1	10.56	689639	0	95885	1237.4	10.50	686063	-3575	3576	42.6
2031	748939	254430	-494508	-759161	-10167.7	10.60	748939	0	103940	1341.3	10.55	745362	-3576	3577	42.6
2032	812098	275353	-536745	-865358	-11569.8	10.62	812098	0	112671	1454.0	10.57	808522	-3576	3577	42.6
2033	879615	298116	-581498	-984074	-13135.4	10.62	879615	0	122136	1576.1	10.58	876038	-3576	3577	42.6
2034	951731	322858	-628872	-1116579	-14880.9	10.61	951731	0	132394	1708.5	10.57	948153	-3577	3578	42.6
2035	1028725	349720	-679004	-1264246	-16824.1	10.59	1028725	0	143516	1852.0	10.55	1025146	-3578	3579	42.6
2036	1109451	378648	-730802	-1428555	-18983.5	10.55	1109451	0	155570	2007.6	10.51	1105871	-3579	3580	42.6
2037	1196511	410022	-786488	-1611111	-21381.1	10.51	1196511	0	168639	2176.3	10.47	1192931	-3579	3580	42.6
2038	1290842	444031	-846811	-1813776	-24041.7	10.47	1290842	0	182804	2359.1	10.44	1287263	-3578	3579	42.6
2039	1393224	480860	-912363	-2038661	-26992.7	10.43	1393224	0	198161	2557.2	10.40	1389645	-3578	3579	42.6
2040	1504361	520699	-983661	-2288015	-30264.4	10.40	1504361	0	214806	2772.0	10.38	1500782	-3578	3579	42.6
2041	1623682	563306	-1060375	-2564470	-33889.2	10.38	1623682	0	232849	3004.9	10.35	1620103	-3578	3579	42.6
2042	1753656	609404	-1144250	-2870724	-37904.2	10.36	1753656	0	252409	3257.3	10.34	1750077	-3578	3579	42.6
2043	1895460	659287	-1236171	-3209889	-42350.3	10.35	1895460	0	273610	3530.9	10.33	1898882	-3577	3578	42.6
2044	2050235	713249	-1336984	-3585494	-47272.7	10.35	2050235	0	296594	3827.5	10.33	2046658	-3576	3577	42.6
2045	2219122	771586	-1447535	-4001295	-52721.6	10.35	2219122	0	321507	4149.0	10.34	2215544	-3577	3578	42.6
2046	2403259	834589	-1568669	-4461551	-58751.8	10.37	2403259	0	348516	4497.5	10.35	2399681	-3577	3578	42.6
2047	2603832	902553	-1701277	-4970865	-65423.9	10.39	2603832	0	377789	4875.3	10.37	2600256	-3575	3576	42.6
2048	2822034	975775	-1846258	-5534368	-72804.6	10.41	2822034	0	409523	5284.8	10.40	2818458	-3575	3576	42.6
2049	3059029	1054545	-2004483	-6157640	-80966.7	10.44	3059029	0	443926	5728.7	10.43	3055453	-3575	3576	42.6
2050	3316009	1139162	-2176846	-6846902	-89990.4	10.48	3316009	0	481215	6210.0	10.47	3312433	-3575	3576	42.6

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's low/low fertility and high economic assumptions.

		Fund D					Fund E					Fund F				
		Entry age normal funding					Entry age normal funding of retirement benefits, pay-go funding of balance					Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance				
	Benefits and expenses	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund
	($M)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
1978	1382	3.60	2101	719	1018	14.3	3.60	2101	719	1018	14.3	3.60	2101	719	1018	14.3
1979	1764	3.60	2403	639	1196	16.2	3.60	2403	639	1196	16.2	3.60	2403	639	1196	16.2
1980	2198	12.76	9722	7523	1546	25.2	9.70	7385	5187	1488	22.8	6.29	4791	2593	1424	20.2
1981	2640	12.76	11053	8413	2466	36.1	9.75	8441	5801	2164	30.8	6.41	5550	2910	1830	24.9
1982	3153	12.76	12538	9384	3567	49.1	9.80	9627	6474	2970	40.3	6.53	6412	3258	2308	30.5
1983	3700	12.76	14189	10489	4877	64.4	9.84	10941	7241	3924	51.4	6.63	7372	3672	2869	37.0
1984	4332	12.76	16017	11685	6427	82.5	9.88	12400	8068	5049	64.5	6.73	8447	4115	3527	44.7
1985	5060	12.76	18035	12976	8237	103.8	10.47	14790	9730	6377	80.6	7.37	10419	5359	4308	54.3
1986	5934	12.76	20347	14412	10312	128.5	10.82	17248	11314	7966	99.9	7.78	12399	6465	5267	66.1
1987	6922	12.76	22848	15927	12743	157.2	10.85	19415	12493	9866	122.3	7.85	14057	7136	6430	79.6
1988	8032	12.76	25529	17497	15561	190.2	10.87	21751	13719	12069	148.1	7.93	15859	7827	7776	95.2
1989	9267	12.76	28377	19110	18794	228.1	10.91	24246	14979	14596	177.6	8.00	17798	8531	9312	113.1
1990	10632	12.76	31381	20750	22359	271.2	10.94	26894	16262	17381	211.3	8.08	19873	9241	10996	133.3
1991	12090	12.76	34298	22208	26016	319.4	10.97	29489	17399	20236	248.9	8.16	21935	9845	12714	155.9
1992	13690	12.76	37406	23716	30110	373.3	11.01	32266	18576	23434	290.9	8.24	24158	10468	14634	181.0
1993	15446	12.76	40754	25308	34675	433.3	11.04	35266	19820	26999	337.8	8.32	26573	11128	16767	208.9
1994	17373	12.76	44389	27015	39757	500.0	11.08	38533	21160	30968	389.9	8.40	29217	11844	19132	239.9
1995	19481	12.76	48357	28876	45403	574.3	11.11	42104	22623	35375	447.9	8.48	32117	12636	21749	274.2
1996	21759	12.76	52746	30987	51680	657.0	11.15	46065	24306	40275	512.5	8.55	35336	13577	24650	312.5
1997	24255	12.76	57554	33299	58663	748.9	11.18	50406	26151	45729	584.3	8.62	38874	14619	27873	355.0
1998	26992	12.76	62815	35823	66424	851.2	11.21	55164	28172	51794	664.3	8.69	42759	15767	31450	402.2
1999	30000	12.76	68567	38567	75038	964.8	11.24	60379	30379	58524	753.2	8.75	47026	17027	35410	454.6
2000	33297	12.76	74847	41550	84590	1090.9	11.27	66081	32784	65999	852.0	8.82	51700	18403	39810	512.8

		Fund D					Fund E					Fund F				
		Entry age normal funding					Entry age normal funding of retirement benefits, pay-go funding of balance					Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance				
	Benefits and expenses	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund
	($M)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
2001	36733	12.76	81672	44939	95119	1231.0	11.29	72264	35530	74252	961.8	8.87	56745	20012	44672	577.5
2002	40552	12.76	89104	48552	106791	1386.3	11.32	79016	38465	83413	1083.6	8.92	62273	21722	50069	649.3
2003	44807	12.76	97182	52376	119723	1558.4	11.34	86372	41565	93570	1218.8	8.97	68317	23510	56052	728.9
2004	49569	12.76	105949	56381	134027	1748.8	11.37	94379	44810	104820	1368.4	9.03	74924	25355	62674	816.9
2005	54902	12.76	115447	60545	149849	1959.2	11.40	103080	48178	117267	1533.9	9.08	82137	27235	69996	914.1
2006	60703	12.76	125667	64964	167355	2191.5	11.42	112468	51765	131042	1716.7	9.13	89900	29197	78084	1021.4
2007	67221	12.76	136713	69492	186657	2447.7	11.45	122623	55402	146233	1918.3	9.18	98354	31133	86987	1139.5
2008	74570	12.76	148637	74067	207913	2729.7	11.47	133608	59038	162966	2140.3	9.24	107573	33003	96773	1269.3
2009	82851	12.76	161495	78644	231283	3039.6	11.50	145474	62623	181366	2384.3	9.30	117620	34769	107514	1411.6
2010	92215	12.76	175338	83123	257071	3379.8	11.52	158318	66104	201667	2652.1	9.36	128605	36391	119337	1567.3
2011	102737	12.76	190048	87311	285735	3752.8	11.55	172015	69278	224227	2945.6	9.43	140397	37659	132444	1737.4
2012	114385	12.76	205895	91511	317158	4161.5	11.57	186669	72285	248944	3266.8	9.49	153132	38748	146755	1922.9
2013	127424	12.76	222976	95552	351573	4608.6	11.59	202534	75111	275989	3617.9	9.56	167082	39659	162357	2124.9
2014	141964	12.76	241386	99423	389214	5097.3	11.62	219706	77742	305535	4001.2	9.64	182359	40395	179342	2344.7
2015	158092	12.76	261225	103133	430336	5630.7	11.64	238258	80166	337777	4419.1	9.73	199053	40961	197811	2583.4
2016	175677	12.76	282369	106692	475222	6212.7	11.66	258072	82395	372937	4874.4	9.81	217068	41391	217878	2842.7
2017	195117	12.76	305189	110072	524178	6846.9	11.69	279501	84384	411225	5370.1	9.90	236765	41648	239661	3124.0
2018	216535	12.76	329836	113301	577520	7537.7	11.71	302649	86113	452894	5909.1	9.99	258261	41726	263292	3429.0
2019	240089	12.76	356462	116373	635612	8289.7	11.73	327651	87562	498199	6494.8	10.09	281708	41619	288913	3759.6
2020	265921	12.76	385218	119297	698840	9107.9	11.75	354633	88712	547428	7131.0	10.18	307244	41323	316668	4117.6
2021	294170	12.76	415916	121746	767617	9997.2	11.77	383491	89322	600877	7821.2	10.27	334819	40649	346726	4504.9
2022	325121	12.76	449132	124011	842368	10963.6	11.79	414769	89648	658860	8569.7	10.37	364942	39821	379254	4924.0
2023	358896	12.76	485102	126206	923590	12013.4	11.80	448621	89725	721736	9381.1	10.47	397773	38877	414431	5377.3
2024	395693	12.76	524063	128371	1011820	13153.6	11.82	485282	89589	789895	10260.6	10.56	433552	37860	452492	5867.7
2025	435650	12.76	566252	130602	1107639	14391.8	11.83	524926	89276	863763	11213.7	10.65	472459	36809	493656	6398.1

		Fund D					Fund E					Fund F				
		Entry age normal funding					Entry age normal funding of retirement benefits, pay-go funding of balance					Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance				
	Benefits and expenses	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund	Cont. rate	Contri-butions	Cash flow	Inte-rest	Fund
	($M)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)	(%)	($M)	($M)	($M)	($B)
2026	479804	12.76	611193	131390	1211672	15734.9	11.84	567207	87404	943784	12244.8	10.74	514457	34653	538167	6971.0
2027	527318	12.76	660013	132695	1324496	17192.1	11.86	613099	85780	1030364	13361.0	10.83	560141	32822	586252	7590.0
2028	578091	12.76	713125	135034	1446965	18774.1	11.86	662884	84792	1124101	14569.9	10.91	609725	31634	638222	8259.9
2029	632191	12.76	770943	138752	1579903	20492.7	11.87	717021	84830	1225649	15880.4	10.99	663594	31404	694491	8985.8
2030	689639	9.69	633278	-56360	1720200	22156.6	9.66	631165	-58473	1332711	17154.6	9.78	639085	-50553	753742	9689.0
2031	748939	9.69	685032	-63906	1859777	23952.4	9.67	683277	-65660	1439598	18528.5	9.84	695763	-53175	812758	10448.5
2032	812098	9.69	741365	-70732	2010510	25892.2	9.68	740050	-72048	1554864	20011.4	9.90	757235	-54862	876523	11270.2
2033	879615	9.69	802653	-76961	2173313	27988.6	9.68	801936	-77678	1679306	21613.0	9.95	823886	-55728	945525	12160.0
2034	951731	9.69	869269	-82460	2349293	30255.4	9.69	869136	-82593	1813730	23344.1	9.99	895848	-55882	1020266	13124.4
2035	1028725	9.69	941593	-87131	2539628	32707.9	9.70	941886	-86838	1959081	25216.4	10.02	973287	-55437	1101285	14170.2
2036	1109451	9.69	1019479	-89971	2745537	35363.5	9.70	1020192	-89259	2116282	27243.4	10.04	1055808	-53642	1189170	15305.8
2037	1196511	9.69	1103951	-92559	2968595	38239.5	9.70	1105116	-91394	2286516	29438.5	10.05	1144826	-51684	1284591	16538.7
2038	1290842	9.69	1195516	-95325	3210091	41354.3	9.71	1197262	-93579	2470857	31815.8	10.06	1240956	-49885	1388175	17877.0
2039	1393224	9.69	1294675	-98548	3471685	44727.4	9.71	1297060	-96163	2670484	34390.1	10.07	1344640	-48583	1500634	19329.0
2040	1504361	9.69	1401938	-102422	3754934	48379.9	9.71	1404875	-99485	2886669	37177.3	10.07	1456265	-48095	1622607	20903.5
2041	1623682	9.69	1516654	-107027	4061653	52334.5	9.71	1520034	-103647	3120722	40194.4	10.06	1574706	-48975	1754847	22609.4
2042	1753656	9.69	1640770	-112885	4393718	56615.4	9.71	1644368	-109287	3373991	43459.1	10.06	1702390	-51265	1898098	24456.2
2043	1895460	9.69	1775076	-120383	4753134	61248.1	9.71	1778646	-116813	3648110	46990.4	10.05	1840215	-55244	2053147	26454.1
2044	2050235	9.69	1920364	-129870	5142058	66260.3	9.71	1923602	-126632	3944519	50808.3	10.04	1989048	-61186	2220866	28613.8
2045	2219122	9.69	2077430	-141691	5562879	71681.5	9.70	2079975	-139146	4264971	54934.1	10.03	2149762	-69359	2402082	30946.5
2046	2403259	9.69	2247060	-156198	6017949	77543.2	9.70	2248510	-154748	4611182	59390.5	10.02	2323225	-80033	2597823	33464.3
2047	2603832	9.69	2430050	-173781	6509969	83879.4	9.69	2429982	-173849	4985142	64201.8	10.01	2510350	-93481	2809021	36179.9
2048	2822034	9.69	2627192	-194841	7041779	90726.4	9.69	2625178	-196855	5388801	69393.7	10.01	2712053	-109980	3036762	39106.6
2049	3059029	9.69	2839277	-219751	7616377	98123.0	9.68	2834868	-224160	5824348	74993.9	10.00	2929236	-129792	3282210	42259.1
2050	3316009	9.69	3067102	-248906	8237094	106111.2	9.67	3059829	-256179	6294055	81031.8	10.00	3162807	-153201	3546530	45652.4

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's low low fertility and high economic assumptions.

Canada Pension Plan, Financial Effect of Baby Boom on Critical Years, Fund A,(a) Canada less Quebec — Appendix G-5

	Total population	Excluding baby boom
Year cash flow first negative	1986	1984
Year interest first required from provinces (maximum fund)	1992	1991
Year fund first becomes negative	2001	1999

a Contributions continue to be 3.6 per cent of contributory earnings.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's low/low fertility and high economic assumptions.

Canada Pension Plan, Comparison of Expenditures as Percentages of Contributory Earnings, and the Fund as a Multiple of Expenditures, Fund B,(a) Including and Excluding the Baby Boom, Canada Less Quebec

Appendix G-6

	Canada less Quebec	
	Total population	Excluding baby boom
Year cash flow first set to zero	1986	1984
Pay-go contributions in subsequent years, as percentage of contributory earnings		
1990	4.32	4.65
2000	5.68	6.15
2010	6.71	7.34
2020	8.81	8.99
2030	10.56	10.07
2040	10.40	10.39
2050	10.48	10.33
Fund as multiple of benefits		
1990	4.30	4.02
2000	3.26	3.06
2010	2.67	2.52
2020	2.08	2.07
2030	1.79	1.89
2040	1.84	1.87
2050	1.87	1.91

a Cash flow is not to be negative.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's low/low fertility and high economic assumptions.

Canada Pension Plan, Comparison of Expenditures as Percentages of Contributory Earnings, and the Fund as a Multiple of Expenditures, Fund C,(a) Including and Excluding the Baby Boom, Canada Less Quebec

Appendix G-7

	Canada less Quebec	
	Total population	Excluding baby boom
Year cash flow first negative	1986	1984
Pay-go contributions in subsequent years, as percentage of contributory earnings		
2000	5.02	5.59
2010	6.45	7.11
2020	8.69	8.89
2030	10.50	10.02
2040	10.38	10.37
2050	10.47	10.32
Fund as multiple of benefits		
2000	1.28	1.01
2010	.46	.37
2020	.16	.13
2030	.06	.05
2040	.03	.02
2050	.01	.01

a Cash flow not greater than interest when negative.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's low/low fertility and high economic assumptions.

Projected Expenditures for Old Age Security, Canada, 1979-2050

Appendix G-8

	Millions of dollars			Percentage of GNP			Percentage of CPP/QPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed
1979	4,299	4,320	4,435	1.65	1.66	1.70	4.91	4.93	5.07
1980	4,421	4,500	4,920	1.52	1.55	1.69	4.45	4.53	4.95
1985	4,942	5,704	7,882	.99	1.15	1.59	2.74	3.16	4.37
1990	5,623	8,293	12,529	.71	1.04	1.57	1.80	2.65	4.02
1995	6,191	11,896	18,475	.50	.97	1.51	1.30	2.50	3.87
2000	6,626	16,757	26,460	.35	.88	1.39	.90	2.28	3.60
2005	6,989	23,430	37,345	.24	.80	1.27	.62	2.08	3.32
2010	7,725	35,372	55,243	.17	.79	1.24	.46	2.11	3.26
2015	8,986	56,510	85,999	.14	.85	1.30	.36	2.26	3.42
2020	10,424	87,924	133,501	.11	.91	1.38	.28	2.36	3.62
2025	11,891	132,553	203,802	.08	.94	1.45	.22	2.45	3.79
2030	13,100	190,899	300,439	.06	.93	1.46	.17	2.48	3.82
2035	13,380	249,212	410,631	.04	.82	1.34	.11	2.05	3.52
2040	13,214	318,614	542,691	.03	.70	1.19	.08	1.93	3.14
2045	13,181	424,872	724,420	.02	.63	1.08	.05	1.61	2.84
2050	13,420	588,189	987,060	.01	.59	1.00	.04	1.75	2.63

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's "low/low" fertility and "high" economic assumptions.

Projected Expenditures for Guaranteed Income Supplement and the Spouse's Allowance, Canada, 1979-2050 Appendix G-9

	Millions of dollars			Percentage of GNP			Percentage of CPP/QPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed
1979	1,535	1,615	1,658	.59	.62	.64	1.75	1.84	1.89
1980	1,553	1,650	1,803	.53	.57	.62	1.56	1.66	1.81
1985	1,618	1,943	2,684	.33	.39	.54	.90	1.08	1.49
1990	1,710	2,610	3,942	.21	.33	.49	.55	.84	1.26
1995	1,822	3,620	5,621	.15	.30	.46	.38	.76	1.18
2000	1,906	4,980	7,868	.10	.26	.41	.26	.68	1.07
2005	1,968	6,815	10,869	.07	.23	.37	.18	.61	.97
2010	2,128	10,070	15,734	.05	.23	.35	.13	.59	.93
2015	2,415	15,695	23,889	.04	.24	.36	.10	.62	.95
2020	2,730	23,822	36,148	.03	.25	.37	.07	.65	.98
2025	3,031	34,909	53,706	.02	.25	.38	.06	.65	1.00
2030	3,254	48,988	77,146	.02	.24	.37	.04	.62	.98
2035	3,240	62,389	102,783	.01	.20	.34	.03	.54	.88
2040	3,122	77,804	132,545	.01	.17	.29	.02	.45	.77
2045	3,039	101,367	172,687	.005	.15	.26	.01	.40	.68
2050	3,017	136,707	229,374	.003	.14	.23	.01	.36	.61

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's "low/low" fertility and "high" economic assumptions.

Index

Appeals procedure, 134-135, 144. See also Pension Appeals Board
Average Industrial Wage (AIW), 122, 125, 126, 143, 144

Caisse de dépôt du Québec, 97-98
Canada Pension Plan (CPP)
  benefits, 3, 5-6, 7, 8, 11, 12, 15, 25, 26, 27, 68-71, 87, 102, 115, 125-128, 130-131, 139, 144
    children's, 15, 25, 27
    death, 28, 121
    disability, 11, 12, 13, 25, 27, 28, 69, 228
    flat-rate, 13, 25, 27
    lump-sum, 25
    surviving spouse, 5, 7, 12, 13, 25, 27, 112, 118-120, 121, 140, 143, 224, 228
  ceiling, 5, 7, 8, 10, 13, 88
    Year's Maximum Pensionable Earnings (YMPE), 12, 13, 14, 26, 121, 124, 127, 132, 143, 218, 230
  child-rearing dropout, 11, 14, 115-118, 140, 143, 224, 231
  contributions, 3, 5, 7, 8, 9, 11, 15, 26, 68, 69, 85, 87, 88, 102, 105-106, 116, 139, 140, 142
  coverage, 11, 25, 110, 112-115
  credit splitting, 15, 28, 120-122
  earnings test, 78, 129, 144
  effect on personal savings, 162, 164-167
  eligibility, 134,144
  entry age, 225, 229, 230
  funding, 15, 55-65, 68-82, 85-106, 139, 162, 167, 225, 226-231
    full, 55, 63, 64, 76-77, 78, 81, 86, 89, 92, 95-106, 162, 163, 167, 188-190
    partial, 55, 57, 58, 63, 89
    pay-as-you-go, 3, 5, 15, 55, 56, 57, 58, 63, 64, 68, 69, 71, 74, 76, 78, 81, 85, 86, 88, 89, 90, 91, 92-95, 101, 105, 140, 141, 142, 162, 163, 167, 188, 189, 190, 191, 230
  history, 1-16, 20-22
  indexing, 10, 48, 69, 71, 228
  portability, 25, 26, 110
  Year's Basic Exemption (YBE), 14, 26, 218
Canadian Labour Congress (CLC), 7, 122-123, 124, 125, 127
Child-rearing dropout. See CPP
Cofirentes Report, 121, 124, 126, 140
Consumer Price Index (CPI), 13, 124, 125, 144, 212
Costs. See CPP, funding

Demography, 31-42, 49-50, 52, 147-158, 165, 200-211, 231-232
  fertility, 31, 32, 35-37, 41, 50, 60-61, 71, 74, 79, 90, 147-149, 152, 158, 202-204, 207, 231, 237
  migration, 41, 149-150, 205-207
    emigration, 34, 37, 79, 149, 205-207, 231-232
    immigration, 31, 34, 37-39, 50, 60, 79, 81, 149, 154, 158, 205-207, 231-232
  mortality, 34, 39-41, 45, 50, 150-151, 154, 200-202
Department of Insurance (federal), 79, 80, 201, 214, 224, 227
Dependency ratios, 45-52, 158
Divorce, 120, 224

Employment pension plans, 110, 127, 167-169

Fertility. See Demography

Gross National Product (GNP), 48, 49, 95, 163, 182-184, 236, 239
Guaranteed Annual Income System (GAINS), 28, 32, 119, 122, 125, 126, 128
Guaranteed Income Supplement (GIS), 4, 28, 32, 48, 49, 55, 88, 93, 119, 121, 122, 124, 125, 126, 128, 131, 140, 141, 162, 236, 237, 238

Inflation, 61-62, 69, 71, 74, 79, 81, 165, 236
  scenarios, 212-214
Life expectancy. See Mortality under Demography
Locking-in. See Portability under CPP

Migration. See Demography
Ministry of Treasury, Economics and Intergovernmental Affairs (Ontario) (TEIGA), 93, 99, 162, 163, 184-185
Mortality. See Demography

National Symposium on Aging, 51, 236

Old Age Security (OAS), 1, 2, 32, 48, 55, 56, 88, 93, 119, 121, 122, 124, 125, 128, 130, 131, 132, 133, 141, 162, 181, 236-239
  benefits, 3, 4, 8, 237
  eligibility, 4
  means test, 1
Ontario Archivist, viii, 65
Ontario Municipal Employees Retirement System (OMERS), 98, 99

Participation rates, 218, 219
Pay-go. See Pay-as-you-go under CPP, funding
Pension Benefits Act (Ontario), 2, 3
Pensionable earnings, 124
Pension Appeals Board, 134-135
Private pension plans. See Employment pension plans
Provincial Universal Retirement System (PURS), 141
Public pension plans. See CPP, OAS, QPP, Social Security

Quebec Pension Plan (QPP), 8-10, 11, 12, 13, 14, 25, 48, 78, 94, 115, 118, 121, 122, 124, 126, 129, 161, 167, 181, 184, 190, 236, 238

Registered Retirement Savings Plan (RRSP), 184
Retirement age, 63, 128-131

Savings, 169-177. See also CPP, effect on personal savings, and impact of social security financing, 179
and the life-cycle hypothesis, 177, 179-182
Social security, 161-163, 184-188
benefits, 32, 128-129
disability, 2
supplemental, 28, 32, 236-239
survivor, 2
funding, 55-56, 161, 179-182
in United States, 1, 2, 78, 129, 131-134, 161, 162, 181, 201, 202
Spouse's Allowance (SA), 28, 32, 49, 125, 128, 236, 237, 238

Welfare. See Social security, benefits, supplemental

Report of the Royal Commission on the Status of Pensions in Ontario

VOLUME VI

Pensions for Ontario Public Sector Employees

1980

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Volume I
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Your Income in Retirement (a Consumer's Guide)

Ontario and the Canada Pension Plan

Volume V

Pensions for Ontario Public Sector Employees

Volume VI
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Pensions for Ontario Public Sector Employees

The Royal Commission on the Status of Pensions in Ontario

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1980

Introduction

When the Ontario Pension Benefits Act was introduced in 1965, the government decided that this legislation would regulate not only pension plans sponsored by employers in the private sector but also those plans provided by the Government of Ontario and its agents for their employees.(1) Employer by definition in the act "means, in relation to an employee, any person or association from whom the employee receives remuneration, and includes Her Majesty in right of Ontario, an agent of Her Majesty, a municipality as defined in The Municipal Affairs Act, and a metropolitan municipality and the local boards thereof."(2)

Under the act, certain obligations are placed on the employer who chooses to sponsor a pension plan. These requirements apply to all employers coming within the definition; with one exception, the rules are the same for both private and public employers.(3)

The Ontario government may be involved in pension plans directly, as in the Ontario Public Service Superannuation Fund; through a Crown corporation as in the Ontario Hydro plan; or indirectly, as a specific guarantor as in the Teachers' Superannuation Fund, or as an implicit guarantor through funding of health costs as in the Hospitals of Ontario Pension Plan. Municipal governments may be involved through OMERS, (Ontario Municipal Employees Retirement System, a multi-employer plan) or directly in plans sponsored by individual municipalities before OMERS came into existence. Throughout the report, plans in which the Government of Ontario is directly or indirectly responsible for costs are referred to as "public sector plans" to distinguish them from those of private employers which are called "private sector plans." Government-sponsored plans where the government is not in the role of employer, such as GAINS, GIS and the Canada Pension Plan, are referred to as "government programs" and are clearly not within the ambit of public sector plans.

Since the Ontario public sector plans are regulated on the same basis as those of private employers, they share the aspects of plan design and the problems of employment pension plans discussed in Design

for Retirement. Thus, the Commission's recommendations in Volumes II and III for employment pension plans apply to plans in both the public and private sectors.

There are however a number of matters which specifically concern public sector plans. The Honourable William Davis in his statement to the Legislature on the establishment of this Commission noted that the conspicuous fully-indexed benefits of federal and provincial public-employee pension plans had caused some public dissatisfaction with private sector pensions. The Commission was specifically directed to study the interrelationship between private and public sector pension plans. Other issues arise only for public sector plans, such as the investment of pension funds, the existence of the funds themselves, cost control in a non-profit climate, and the subject of collective bargaining for pension rights. For this reason, the Commission decided to deal with the public sector plans in a separate section of the report. Readers particularly interested in plans for Ontario government employees must refer to Volumes II and III of the report as well as to Volumes VI and VII for the complete discussion and recommendations affecting public sector plans.

In its assessment the Commission has directed itself in large measure to the consideration of the cost of public sector pensions. It became clear to the Commission in its deliberations that pension cost in the public sector is not subject to the same constraints of profitability and competition as that in the private sector. This factor, coupled with the enormous size of the public sector pension commitments, caused the Commission to concentrate on the problems of cost identification and cost control for the protection of both plan members and the taxpayers of the province.

In Ontario, 648,014 employees of government (federal, provincial and municipal) are covered by pension plans. Of these about 455,000 are in the Ontario public sector; the balance are federal civil servants most of whom are covered under the Public Service Superannuation Act of Canada.(4) This act is not subject to either the Pension Benefits Act of Ontario or the Federal Pension Benefits Standards Act.(5) In practice, however, the Superannuation Act parallels in most respects the requirements of the Pension Benefits Act. References to data on the Ontario public sector plans contained in Volumes VI and VII do not include employees who may be members of federal government plans. However, most pension data sources, including Statistics Canada, include these federal plan members as part of Ontario's public sector, and those sources were used by the Commission in other volumes of the report. This must be kept in mind when considering the public sector data. The discussion does not include federal government plans unless specific reference is made to them.

There are some 127 public sector plans in the province covering Ontario government employees. In order to collect factual details of

these plans the Commission obtained the services of Dr. Laurence Kelly, an industrial relations consultant associated with Queen's University, Kingston. Dr. Kelly obtained information through questionnaires directed to each of the 127 plan sponsors and also by meeting with a number of individuals and groups participating in these plans. In addition, the Commission received many briefs and heard submissions from persons concerned with the public sector plans. The factual data compiled by Dr. Kelly is entitled, "Ontario Public Sector Pension Plan Data," and is found in Volume VII of the report. It is referred to in the text as the "public sector study." Dr. Kelly also presented his discussion of the data in report form which has been in large part incorporated into the text of Volume VI. The original report is filed with the Archivist of Ontario as part of the Commission's papers.

Occasionally discrepancies may be noted between the public sector study and other data supplied to the Commission and used in Volume VI. These discrepancies reflect primarily difficulties in obtaining data based on the same time periods and on the same data criteria. This is perhaps one of the most difficult problems which public sector administrators must face in seeking effective control over the plans. However, the Commission is satisfied that the public sector study provides a sufficient base for its assessment of public sector plans in Ontario today.

NOTES

(1) The Pension Benefits Act, R.S.O. 1970, c. 342, does not apply to the pensions of members of the Ontario Legislature. They come under The Legislative Assembly Retirement Allowances Act, R.S.O. 1970, c. 241, and are not "employees" as defined in the Pension Benefits Act. A minor exception for retirement allowances under The Municipal Act and The Schools Administration Act is made in section 21 of the Regulation, R.R.O. 1970, Reg. 654, under the Pension Benefits Act.

(2) Pension Benefits Act, s. 1(d).

(3) This exception deals with the funding of initial unfunded liabilities for past service existing on January 1, 1965 when the Pension Benefits Act came into force. Under the act such initial unfunded liabilities in the plan of a private employer are amortized over not more than 25 years and are being gradually paid off by special payments ending in 1989. Government bodies are not required to make special payments but pay interest only on these initial unfunded liabilities, with the result that these liabilities continue but do not increase. (O. Reg. 654, sec. 2(13))

(4) The Public Service Superannuation Act, S.C. 1952-53, c. 47.

(5) Pension Benefits Standards Act, R.S.C. 1970, c. P-8.

Pensions for Ontario Public Sector Employees

Contents

VOLUME VI

Introduction

1. Membership

2. Plan Features

3. Funding of Public Sector Plans

4. Investment

5. Present and Future Costs

6. Other Public Sector Pension Issues

7. Conclusions

Index

VOLUME VII

Background Studies

Pensions for Ontario Public Sector Employees

Volume VI

Contents

	INTRODUCTION	iv
1.	MEMBERSHIP	1
	The Public Sector	1
	Profile of the Membership	3
	Active Members	3
	Pensioners	13
	Growth	17
	Members	17
	Funds	20
	Notes	26
	List of Tables	27
	List of Charts	27
2.	PLAN FEATURES	28
	Introduction - The Original Public Sector Plans	28
	Uncovered Employees	29

Benefits 32
Retirement Benefits 32
Adjustments for Inflation 33
Survivor Benefits 37
Disability Benefits 39
Benefit Levels 39
Integration 43

Retirement Age 46
Submissions 50

Contributions 52

Vesting, Locking-in, and Portability 54
Portability 54
Desired Changes 56

Disclosure 57

Comparisons with Other Jurisdictions 58
Government Employee Plans 59

Notes 62

List of Tables 64

3. FUNDING OF PUBLIC SECTOR PLANS 65

Introduction 65

Funded Status of Six Major Plans 66

Desirability of Funding 69

Funding Methods 70

Matching Contributions 71

Legislative Amendments Required 76

Existence of the Fund 76

Funding of Indexed Benefits 78
The Superannuation Adjustment Benefits Act 78
Cash Flow Projections for the Adjustment Funds 80

Public Sector Study - Comparison of Funding of Public Sector Plans 83
Employer Contributions 84

Assets and Liabilities 86
Actuarial Valuations 90
Plan Valuation and Liabilities 92

Management Board Guidelines 93

Notes 97

List of Tables 98

4. INVESTMENT 99

Introduction 99

Current Investment Practices 99
Non-market Investing 100
Market Investing 102
Deposits with Insurance Companies 103

Investment Yields 105

The OMERS Experiment 109

The Public's Views on Investment 110

Social and Economic Goals and Investment 115
Effects on the Capital Markets 116
Effect of CPP Investment Proposals 117

Recommendations 117

Notes 119

List of Tables 120

5. PRESENT AND FUTURE COST OF PUBLIC SECTOR PENSIONS 121

Introduction 121

What is the Cost of a Pension Plan? 122
Effect of Funding Method on Cost 123
Complete Cost Picture 124
Costs as Reflected in the Public Accounts 125
Problem Areas in Overall Cost Assessment 125

Magnitude of Costs and Liabilities 133

Comparison with the Private Sector 139
Does the Public Sector in Fact Lead? 142

Effective Cost Control 146
Cost Control Responsibility 148
Fixing the Inflation Assumption 149
Determination of Total Cost 150
Disclosure and Assessment of Total Cost 152
Effect of Investment on Cost 153

Future Pension Costs for Ontario Public Sector Employees 154

Future Pension Costs, Ontario Public Sector: A Scenario 155
Introduction 155
Methodology 156
Growth Rates in the Five Public Service Sub-sectors 157
Age-Sex Distribution 164
Five-Year Survival Factors 166
Population Projections 1980 to 2005 172
Projection of Payrolls 175
Pension Costs as a Percentage of Pensionable Payroll 175
The Cost of Indexing Pensions 181
Projected Payrolls and Pension Costs: 1980-2005 183
Conclusions 187

Notes 189

List of Tables 190

6. OTHER PUBLIC SECTOR PENSION ISSUES 192

Collective Bargaining of Pensions 192
Alternatives to Collective Bargaining 196

Pensioner Representation 199

Reciprocal Transfer Agreements 200
Transfers 201

Pensions for Provincial Judges 204
Submission of the Judges 205
Conclusion 207

Pension Parity 208

Administration of Public Sector Pensions 215

Effect on the Public Sector of the Commission's Recommendations for Employment Pension Plans 218

Notes 220

List of Tables 221

7. CONCLUSIONS 222

INDEX 224

Chapter 1

Membership

THE PUBLIC SECTOR

There are 127 pension plans in the Ontario public sector, which includes the provincial government, its agents and corporations, and municipalities; and other bodies receiving funds directly or indirectly from the provincial government or a municipal government in Ontario. These plans had 455,000 active members in 1977. Five of these plans covered 84 per cent of the membership.

For ease of classification these sectors are divided into six sub-sectors as follows:

Provincial Government

The 79,887 members in this sub-sector are employees of the Ontario government directly and of 13 various agencies and boards such as the Workmen's Compensation Board and the Art Gallery of Ontario. In this sub-sector 76,712 (96 per cent) are members of the plan provided by the Public Service Superannuation Act (PSSA).(1) The province itself is the designated employer under the PSSA, and individual boards and agencies are the employers for the balance of employees in this sector.

Education

This sub-sector has 154,704 members, employed by school boards and educational institutions.

The Teachers' Superannuation Act(2) covers 115,563 members and includes teachers in elementary and secondary schools. The Teachers' Superannuation Fund is a multi-employer plan which covers 313

employers, chiefly school boards and designated private schools, although the province makes the employer contributions. The remaining members in this sub-sector are employees of colleges, (including technical colleges), universities, and the Ontario Institute for Studies in Education.

Municipal Government

This sub-sector has 129,015 members of which 106,731 are members of the plan established under the Ontario Municipal Employees Retirement System Act (OMERS).(3) OMERS is a multi-employer plan covering employees of 1,006 Ontario municipalities and local bodies. The province is not a direct employer, but financing for both municipal and non-teaching school board staff occurs through transfer payments from the province. The remaining members are covered by closed municipal plans, the Toronto Transit Commission, conservation authorities, and other local associations and bodies. About 365 small villages and townships in Ontario do not participate in OMERS.

Health

This sub-sector covers employees of hospitals and health institutions and bodies. Of the 68,110 members, 63,645 are members of the Hospitals of Ontario Pension Plan.(HOOPP) This plan is a multi-employer plan in which individual hospitals may participate and are the employers. HOOPP and the plans covering employees in this sub-sector resemble private sector plans but the province provides funds for operating costs generally. There are 258 employers participating in HOOPP.

Provincial Utilities

This sub-sector covers employees of Ontario Hydro and the Ontario Northland Transportation Commission. There are 20,478 members of the Hydro Pension Plan provided for under the Power Corporation Act(4), and 1,622 in the Ontario Northland Transportation Commission plan (ONTC). Ontario Hydro or the Commission is the employer, but the province exercises indirect control over finances.

Legislative Assembly

There are 123 members of the Legislative Assembly for whom pensions are provided under the Legislative Assembly Retirement Allowances Act(5), and 157 members of the Caucus Employees Retirement Plan provided by order-in-council.

The Commission has concentrated on the five largest plans which cover 84 per cent of public sector membership. These are: the Teachers' Superannuation Fund (TSF) (115,563), the Ontario Municipal Employees

Retirement System (OMERS) (106,731), the Public Service Superannuation Fund (PSSF) (76,712), Ontario Hydro Pension Plan (Hydro) (20,478), and Hospitals of Ontario Pension Plan (HOOPP) (63,645).

PROFILE OF THE MEMBERSHIP

Active Members

The following tables show the active membership by age, sex, sub-sector, and years of service.

Table 1
Ontario Public Sector Active Pension Plan Membership, by Age Group and Sex, December 1977

Age	Males	Females
Under 20	190	608
20-24	6,724	16,877
25-29	24,156	38,082
30-34	29,213	25,028
35-39	24,677	18,533
40-44	20,032	14,785
45-49	18,889	14,145
50-54	17,537	13,199
55-59	14,485	10,737
60-64	9,406	7,191
65+	886	639
Sex breakdown only available	70,782	36,318
Total	236,977	196,142

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Table 2
Ontario Public Sector, Percentage Distribution of Active Membership by Age and Sex, 1977

Age	Provincial government (a)		Municipal government (open)(b)		Municipal government (closed)(c)		Health (d)		Education (e)		Provincial utilities (f)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under 20	.2	1.5	.1	2.5	.0	.0	.1	.1	(g)	(g)	.3	1.5
20-24	5.3	16.5	5.5	28.6	.0	.0	4.2	10.2	2.3	7.8	7.5	21.7
25-29	14.4	18.6	13.6	15.0	.7	(g)	11.7	18.8	17.1	30.4	16.4	24.6
30-34	14.3	12.4	16.0	12.5	8.7	7.3	14.0	12.9	23.0	18.9	16.4	15.0
35-39	11.5	9.1	13.2	8.5	13.1	7.7	12.0	11.1	19.7	13.0	11.3	8.7
40-44	10.8	8.3	12.7	6.3	16.0	10.7	10.2	9.9	13.3	9.1	9.9	6.5
45-49	11.1	8.6	12.5	8.7	19.4	16.2	11.2	10.6	10.0	7.6	12.2	7.0
50-54	12.4	9.8	11.7	10.0	17.6	20.5	11.7	10.4	7.1	5.9	12.1	7.3
55-59	11.5	8.8	9.0	4.2	14.9	20.7	11.9	8.9	4.7	4.2	9.1	5.4
60-64	8.0	6.0	5.0	3.2	8.3	14.5	10.9	6.2	2.6	2.8	4.6	2.1
65 and over	.4	.2	.7	.6	1.3	2.2	2.2	.8	.2	.2	.3	.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a Based on data for 79,459 of 79,852 plan members.
b Based on data for 9,958 of 116,582 plan members.
c Based on data for 7,455 of 12,163 plan members.
d Based on data for 62,976 of 69,110 plan members.
e Based on data for 129,316 of 154,704 plan members.
f Based on data for all 22,110 plan members.
g Three persons or less in this age group.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Table 3
Ontario Public Sector, Percentage Distribution of Active Membership by Length of Service, 1977

Pensionable service	Provincial government (a)		Municipal government (open)(b)		Municipal government (closed)(c)		Health (d)		Education (e)		Provincial utilities (f)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
(Years)												
Less than 5	28.1	47.6	39.8	61.4	(g)	(g)	38.6	44.6	27.8	36.9	30.6	46.1
5- 9	26.6	28.2	17.1	19.3	1.2	1.2	33.4	32.6	30.6	33.3	24.3	26.0
10-14	18.0	12.6	14.5	8.0	28.3	48.5	15.3	13.8	23.2	14.4	10.7	12.1
15-19	11.6	6.0	7.9	3.8	26.0	31.5	6.5	5.4	12.0	6.8	4.2	4.7
20-24	8.3	3.2	8.6	3.4	28.2	16.0	4.7	3.1	5.5	3.9	9.8	4.6
25-29	4.2	1.0	7.6	2.5	9.6	1.9	1.3	.4	3.4	2.4	15.1	4.0
30-34	2.6	.4	3.7	1.3	5.9	.5	-	-	1.7	1.4	4.2	1.7
35 or more	.6	.3	.9	.4	.7	.4	.1	(g)	.8	.7	1.2	.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a Based on data for 79,459 of 79,852 plan members.
b Based on data for 9,958 of 116,582 plan members.
c Based on data for 7,455 of 12,163 plan members.
d Based on data for 62,976 of 69,110 plan members.
e Based on data for 129,316 of 154,704 plan members.
f Based on data for all 22,110 plan members.
g Three persons or less in this age group.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Table 4
Ontario Public Sector, Average Years of Pensionable Service by Age and Sex, 1977

Age	Provincial government (a)		Municipal government (open)(b)		Municipal government (closed)(c)		Health (d)		Education (e)		Provincial utilities (f)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under 25	2.3	2.4	2.1	2.3	-	-	2.2	2.1	2.1	2.2	2.1	2.2
25-29	4.4	4.1	2.9	4.3	8.9	7.0(g)	3.5	3.5	3.8	4.6	3.9	4.7
30-34	6.9	5.3	4.8	5.6	11.7	12.0	5.1	5.0	7.4	7.1	6.3	6.8
35-39	9.3	6.4	6.8	6.2	14.7	13.3	6.5	6.1	10.9	8.7	8.4	8.8
40-44	11.5	7.3	9.4	8.1	17.1	14.1	7.2	6.6	13.2	10.3	12.8	11.3
45-49	13.2	8.8	13.2	7.7	19.4	15.0	8.6	8.1	15.0	12.4	18.9	13.2
50-54	15.1	10.2	17.5	11.7	21.8	15.9	9.3	9.3	17.0	15.3	21.8	17.1
55-59	15.9	12.5	22.3	13.3	22.7	17.1	10.2	10.9	18.3	18.2	23.1	19.2
60-64	16.1	14.3	24.8	13.1	21.9	17.8	11.2	12.8	19.0	21.0	24.1	22.8
65 and over	12.4	10.4	24.4	31.3(g)	23.0	17.0	12.1	14.1	14.4	17.8	24.6	23.7(g)

a Based on data for 79,459 of 79,852 plan members.
b Based on data for 9,958 of 116,582 plan members.
c Based on data for 7,455 of 12,163 plan members.
d Based on data for 62,976 of 69,110 plan members.
e Based on data for 129,316 of 154,704 plan members.
f Based on data for all 22,110 plan members.
g Three persons or less in this age group.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Table 5
Ontario Public Sector, Percentage of Active Membership With 10 or More Years of Service, by Age Group, 1977

Age	Provincial government (a)		Municipal government (open)(b)		Municipal government (closed)(c)		Health (d)		Education (e)		Provincial utilities (f)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under 30	2.4	1.7	.4	1.2	38.8	.0(g)	1.0	.3	.4	1.0	1.3	1.9
30-34	27.7	14.9	13.4	24.2	94.3	96.5	11.4	8.1	27.2	30.2	20.7	29.8
35-39	47.3	20.9	33.1	24.4	99.5	100.0	22.0	18.1	64.1	42.0	37.4	40.6
40-44	55.5	26.7	47.0	33.3	100.0	100.0	25.5	21.5	71.0	47.3	56.7	53.9
45-49	60.8	36.2	64.0	28.3	99.6	100.0	36.1	32.9	72.7	56.1	76.5	55.8
50-54	66.4	46.0	78.6	41.5	99.9	98.1	39.6	41.9	64.7	66.5	83.4	73.7
55-59	70.4	62.3	89.2	50.0	99.7	100.0	45.1	53.6	74.5	76.0	85.2	76.9
60-64	76.1	72.8	93.7	70.6	99.3	98.2	52.2	67.2	76.8	85.0	90.0	90.8
65 and over	49.7	50.8	94.1	100.0(g)	100.0	94.1	57.4	72.9	60.5	74.0	94.4	(g)

a Based on data for 79,459 of 79,887 plan members.
b Based on data for 9,958 of 116,852 plan members.
c Based on data for 7,455 of 12,163 plan members.
d Based on data for 62,976 of 69,852 plan members.
e Based on data for 129,316 of 154,704 plan members.
f Based on data for all 22,110 plan members.
g Three persons or less in this age group.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Women represent 45.3 per cent of active plan members. However by sub-sectors the proportion varies widely. Women represent a majority of the active membership in health (79 per cent) and in education (56 per cent). They account for 37 per cent of active membership in provincial government, 31 per cent in municipal government, and 14 per cent in provincial utilities. In each sub-sector women represent a higher proportion of those under 30 years of age than of total membership, ranging from 87 per cent in health to 25 per cent in provincial utilities.

The majority of active pension plan members are under 40 years of age. In each sub-sector, the largest number of members is in the 25 to 29 age group.

In each sub-sector except health, the average service of men exceeds that of women by a significant margin beyond a certain age. This presumably reflects the fact that many women leave employment during child-rearing years and return to work later. The gap tends to narrow in age groups close to retirement age, partly, perhaps, because of the early retirement of long-service males, and partly because in the older age brackets there are likely to be few female re-entrants. The most notable difference between sub-sectors is the shorter average pensionable service in health in each age bracket to 60-65, which is partly explained by the fact that this plan was established only in 1966. The average service in the provincial government is lower than in education, municipal government, or provincial utilities.

In the provincial government and also in education, there is a decline in average pensionable service after age 65. There are very few active members in this age category, however, and close to half of those who continue working beyond the normal retirement age in these sub-sectors are persons who do not meet the minimum service requirements for a pension.

The proportion of active members in each age category who have 10 or more years of pensionable service shows much the same pattern of variation in each sub-sector as does average pensionable service. In each sub-sector except health, the proportion of women who have 10 years service or more is significantly lower than that of men over a fairly broad age range; although the proportions tend to be about the same among those who are close to retirement age. Again, there are quite wide variations between sub-sectors; e.g., in provincial utilities at one extreme, 90 per cent of males and females aged 60-64 have 10 or more years of service, whereas in health, at the other extreme, only about two-thirds of the females and half of the males in that age bracket have at least 10 years' pensionable service. Among those aged 45 or over, the proportion who have 10 or more years of service in each sub-sector varies as follows:

Provincial Government	-	63.0
Municipal - Open	-	77.3
Municipal - Closed	-	99.7
Health	-	46.3
Education	-	70.6
Provincial Utilities	-	81.4

Termination rates of employees by years of service are shown in Table 6.

Termination Rates

Generally speaking, the higher the termination rate, the less the pension cost will be, because fewer employees stay long enough to receive pensions. The higher the average rate of termination, the fewer will be the number of employees who have substantial continuous service. For example, with an average annual termination rate of 6 per cent, just over half of every 100 new employees would still be employed by the same organization after 10 years. With an average termination rate of 2 per cent, 80 per cent of them would acquire 10 years of service.

Table 6 reveals that, except for teachers, and to a lesser extent, hydro and municipal utilities employees, there is a marked decline in termination rates during the first 9 years of service. In all plans except the TSF the termination rates of those with 10 or more years of service are lower - generally much lower - than those of shorter-service employees. The much lower rate for teachers than for other groups is no doubt partly explained by the fact that teaching is a profession that people would normally enter with a view to pursuing it on a career basis; if they change employment, it is very likely to be to another school board. Also important, however, is the fact that the TSF allows employees to leave their contributions in the fund after any length of service in case they return to work. Those who take advantage of this opportunity do not terminate their membership in the plan.

Table 6
Ontario Public Sector, Rates of Termination, by Years of Service, 1977

Years of service	PSSF	Other provincial government agencies	Municipal utilities	TSF	Universities	Ontario Hydro	ONTC
				(Per cent)			
Less than 1	-	11.13	4.84	-	14.30	5.37	3.08
1	24.14	11.92	5.66	1.49	14.65	4.39	18.60
2	10.77	7.25	7.64	1.66	10.50	3.98	17.39
3	7.44	6.86	3.57	1.31	8.45	5.51	8.24
4	7.24	6.20	4.95	1.53	7.38	4.12	8.86
5	6.12	6.3	3.37	1.53	5.41	3.99	6.45
6	5.89	5.7	1.89	1.36	3.56	2.87	10.52
7	3.78	5.8	3.87	1.22	3.86	2.38	5.26
8	5.38	4.54	1.30	.99	3.54	2.53	4.25
9	2.91	4.05	2.76	.97	1.74	3.75	5.40
10 or more	.88	1.93	1.74	1.44	.91	3.87	.60
Average termination rate	6.98	6.59	3.4	1.39	5.7	3.92	6.45

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Termination rates are higher for women. In both the PSSF and TSF, the average termination rates for females is more than twice that of males. Moreover, this is not simply a result of the fact that younger females have high withdrawal rates: in the PSSF, females with 10 or more years of service have a termination rate almost twice that of males while in the TSF the rate for females with 10 or more years of service is about four times that of males. HOOPP was the only other plan which provided data on male and female termination rates. Data for HOOPP for 1976 show that the average termination rate for females (9.59 per cent) was only slightly higher than that for males (9.13 per cent). These figures are not directly comparable with those provided by other plans, since hospital employees are not required to join HOOPP in the first two years of their service, and it is in these two years that termination rates are generally highest. The high termination rates of both males and females from this plan, however, seem to partly explain why pension plan members in the health sub-sector have much shorter pensionable service in each age bracket than those in other plans.

We received some information on the proportion of vested plan members who elect to receive a deferred life annuity rather than a refund of contributions. In the PSSF, which has a 10-year vesting requirement, 12.63 per cent of terminating employees in 1976 who had 10 or more years of service and who had a choice of receiving a refund of their contributions or a deferred life annuity, opted for the latter. In OMERS, over the period 1974-1977, 18.95 per cent of the males and 15.06 per cent of the females who had 10 years of service and who were under age 45 elected a deferred annuity. In the TSF, by contrast, 86.9 per cent of the terminating employees in 1977 who had 10 or more years of service and whose contributions were not required to be locked-in, elected not to withdraw these. Figures provided by Ontario Hydro are not directly comparable, since they relate to all terminating employees entitled to receive a deferred pension, including those whose contributions are required to be locked in under the 45 and 10 rule and those who leave after only one year of service. They show that 10.9 per cent of the vested employees who terminated in 1977 opted for or were required by law to take a deferred life annuity.

Plan Membership and Vesting Provisions

Vesting provisions in the Ontario public sector vary widely, ranging from immediate vesting to vesting after the legally required standard of age 45 and 10 years' service. As shown in Table 7, a majority of all active plan members (61.9 per cent) are subject to a 10-year vesting requirement, which reflects the fact that the vast majority of those in provincial government (99.5 per cent), health (96.0 per cent), and education (84.7 per cent) are covered by such a provision.

Table 7
Ontario Public Sector Employees Covered by Various Vesting Provisions, 1977

Vesting provision	Employees	Per cent of total
	(Number)	
Immediate	122,011	27.1
1 year's service	20,478	4.5
10 years' service	279,067	61.9
Age 45 and 10 years' service	21,052	4.7
Other	8,043	1.8

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Because of the limitations of the data, it is not possible to show the number of vested employees in each sub-sector. It is possible, however, to give a rough indication of how the numbers compare. The highest proportion of vested plan members is in the municipal government, since OMERS, which has immediate vesting, covers 84 per cent of the active members in this sub-sector. A majority of the other plan members in the municipal government are subject to the 45 and 10 vesting provision, which would mean that a minority are vested.

In provincial utilities, a large majority of plan members have vested pension rights since Ontario Hydro, which accounts for 93 per cent of the membership in this sub-sector, has a one-year service requirement. The other employer in this sub-sector - ONTC - has a 10-year vesting requirement. In education where most employees are covered by a 10-year vesting provision, about 60 per cent of all active members are vested, while in the provincial government and health sub-sectors, where this provision also predominates, the proportions are about 38 per cent and 30 per cent respectively.

OMERS, which has immediate vesting, provided data on the percentage of male and female employees who elected a deferred annuity by years of service, with a separate breakdown for those under 45 years of age. The data indicate that employees who are aged 45 or more and who have one to nine years of service are much more likely to elect a deferred annuity than a refund of contributions, than are persons under 45 with the same years of service. Moreover, while there does not appear to be any consistent relationship between length of service and preference for a deferred annuity among those under 45, the fact that the percentage of all plan members electing a deferred annuity increases with length of service, indicates that in the 45 and over group there is a direct relationship between length of service and the propensity to opt for a deferred annuity. The high proportion of employees of all ages who

"elect" a deferred annuity after 10 years of service partly reflects the fact that the contributions of those aged 45 and over are locked in. Among those under 45, the proportion jumps sharply after nine years of service.

Pensioners

Public sector pensioners include those receiving retirement pensions (retirees) as well as those receiving disability pensions and survivor pensions. Table 8 shows the distribution of all pensioners by age and sex.

Table 8
Ontario Public Sector, Distribution of Pensioners by Age and Sex, as of December 1977(a)

Age	Male	Female
55 and under	544	1,107
56-60	1,079	1,893
61-65	3,510	4,671
66-70	5,013	6,361
71-75	2,800	4,296
76-80	1,353	2,526
81 and over	923	2,009
Total	15,222	22,863
Total pensioners	38,085	

a Excludes pensioners in HOOPP, OMERS, provincial utilites, and some smaller plans.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

The data do not always distinguish between the types of pension, that is, whether it is a retirement, survivor, or disability pension. In addition those in receipt of a retirement pension include those who may be receiving a pension which arose as a result of terminating employment with a vested benefit, that is, a deferred life annuity. Thus, retirees may be retirees from other than the public sector. Furthermore, pensions may be paid to those under age 65 or normal retirement age.

The information obtained about pensioners by year of retirement and sex relates mainly to the provincial government and education sub-sectors: over 90 per cent of those for whom these breakdowns were provided were members of plans in these sub-sectors, the vast majority of them members of the PSSF and TSF. The distributions therefore cannot be considered representative of the public sector as a whole, either with respect to the relative number of male and female pensioners (with

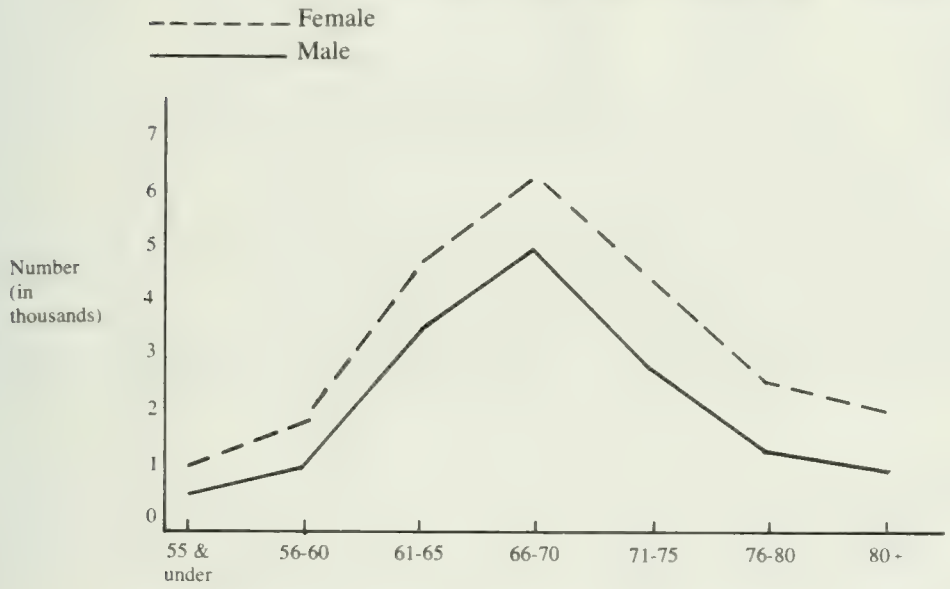
survivors included females represent a majority of the pensioners in both provincial government and education) or with respect to distributions by age and year of retirement (HOOPP and OMERS, which are relatively new plans, could be expected to have very few pensioners in older age categories).

Nevertheless, the figures do provide some insight into trends and patterns in the pensioner population of plans which, for the most part, are mature plans. The data show that 20.6 per cent of those receiving pensions as of December 31, 1977 had been receiving them since 1965 or earlier; another 24.9 per cent had been on pension since 1966-70; while the remaining 53.5 per cent began to receive their pensions in 1971 or later. These proportions reflect a high rate of increase in the number of new pensioners since 1960 as well as the expected mortality among older pensioners.

The high rate of growth is reflected also in the accompanying chart, which shows the distribution of pensioners as of December 1977 according to their ages at that date. The chart shows that by far the largest number of male and female pensioners is in the 66-70 age bracket, which includes those who have retired in recent years at normal retirement age. Thereafter the numbers decline, mainly because there were fewer new pensioners in the years when people in these age categories retired but partly, of course, because of higher mortality rates.

Although not obvious from the chart, there are quite wide variations in the ratio of female to male pensioners in the different age categories. The ratio declines from 2:1 in the 55-and-under age bracket to 1.3:1 in the 66-70 age category, presumably because the number of persons receiving survivor pensions is a diminishing proportion of the total. After age 70 the ratio rises again, reaching 2.2:1 in the 81-and-over age group. In part, this may be the result of differences in mix of male and female retirees in the past; for in the TSF, which accounts for close to half of those to whom the chart relates, there has been a steady decline in the proportion of female contributors. However, differences in male and female mortality rates are undoubtedly also a factor.

Chart 1
Ontario Public Sector, Distribution of Pensioners by Age and Sex,* December 1977



*Excludes pensioners in HOOPP, OMERS, Provincial Utilities and some smaller plans

Care must be taken when looking at figures which are "average" pensions. For example, these may include survivor pensions which are about 50 per cent of retirement pensions. Averages also include those in receipt of pensions with long as well as shorter service. There may also be higher average earnings because of the nature of the work, as is the case with plans having a high proportion of managerial and professional employees. The age of retirees may also be a factor if there is a large number of recent retirees.

Table 9 shows the proportion of pensioners by type of pension.

Table 9
Ontario Public Sector, Pensioners by Type of Pension

	Retirement	Survivor	Disability
		(Per cent)	
PSSF (1976)	66.8	9.3	23.8
TSF (1977)	83.0	9.6	7.4
WCB(a) (1977)	76.7	21.9	1.4
Hydro (1977)	49.7	40.9	9.4
OMERS (1976)	74.5	5.4	20.0

a Workmen's Compensation Board.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

The number of beneficiaries as a percentage of active members is as follows:

PSSF (1977): 14.2 per cent
TSF (1976): 11.3 per cent
OMERS (1977): 9.2 per cent
HOOPP (1977): 14.8 per cent
Hydro (1977): 13.2 per cent

The total number and cost of pensions paid for 1977 for selected plans are as follows:

Table 10
Ontario Public Sector, Total Payments to Pensioners, 1977 (Retired, Disabled, Survivors)

	Amount	
	(Number)	(Millions of dollars)
PSSF	16,376	65,484
TSF	18,969	116,458
OMERS (1976)	11,471	12,856
HOOPP	9,750	9,182
Hydro	4,172	20,568
WCB	365	1,420
Toronto Transit Commission	1,264	5,160
Metro Toronto Police	801	3,921
Toronto Fire Department	489	1,876
Legislative Assembly	76	674

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Plan sponsors or their agents do not maintain detailed files on their pensioner population beyond the information on the amount of pension payable. Distribution of pensioners by age, year of retirement, or years of service is not available and many plans do not distinguish among retirees, survivors, and disabled.

GROWTH

Members

Growth in the number of active members for the five major pension plans is shown in Table 11. Statistics on membership prior to 1960 for plans then in existence are not readily available.

Table 11
Ontario Public Sector, Number of Members of the Five Major Pension Plans, 1960-1977

	TSF	PSSF	Hydro	HOOPP	OMERS
			(Number)		
1979		77,047	23,100	65,052	116,134(E)
1978	135,298	77,564	21,997	64,823	115,615
1977	136,711	76,712	20,478	63,000E	106,030
1976	139,138	75,065	19,555	59,680	102,432
1975	137,280	75,371	19,355	53,474	97,275
1974	131,808	74,540	18,126	50,872	88,708
1973	139,971	72,748	17,461	49,098	83,854
1972	119,873	70,379	17,187	47,409	77,258
1971	105,657	68,735	17,032	42,694	72,659
1970	93,000	62,888	15,711	38,819	64,993
1965	73,006	41,432	11,953	23,942	23,918
1960	48,011	28,413	-	10,988	9,863(a)

E Estimate.

a Figure is for 1963.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data" and Ministry of Treasury and Economics.

Growth rates of the major pension plans vary greatly from plan to plan and over the years. The Ontario public service grew rapidly until 1976 when the government adopted a constraint program. Municipal employment has been growing at a faster rate than provincial employment. Teachers are the victims of demographic shifts resulting from the fall in the birth rate during the late 1960s. The great rate of growth in the health sector reflects society's increasing demand for services. A discussion of future growth trends is found in Chapter 5.

The growth of pensioners over the years is shown in Table 12.

Table 12
Ontario Public Sector Major Pension Plans, Number of Pensioners(a) and Total Payments to Pensioners, Selected Years, 1960-1977

	Teachers' Superannuation Fund		Public Service Superannuation Fund		Ontario Hydro		Hospitals of Ontario Pension Plan		Ontario Municipal Employees Retirement System	
	(Number)	(Amount)	(Number)	(Amount)	(Number)	(Amount)	(Number)	(Amount)	(Number)	(Amount)
1977	18,969	116,458,000	16,376	65,484,000	4,172	20,568,000	9,750	9,182,000	13,160	16,660,000
1976	17,924	101,618,000	15,284	54,863,000	3,969	16,608,000	8,507	7,409,000	11,471	12,867,000
1975	17,113	102,077,000	14,084	45,107,000	3,693	13,829,000	7,922	6,518,000	9,821	8,983,000
1974	16,257	75,145,000	12,972	38,926,000	3,555	12,736,000	7,273	5,010,000	8,394	6,644,000
1973	15,245	62,762,000	11,835	32,062,000	3,350	10,661,000	6,441	4,099,000	6,908	4,612,000
1972	13,792	51,413,000	10,706	26,998,000	3,094	8,645,000	5,607	3,330,000	5,663	3,195,000
1971	12,217	43,937,000	9,506	24,010,000	2,921	7,742,000	4,799	2,687,000	4,592	2,117,000
1970	11,111	35,259,000	8,607	20,507,000	2,704	6,237,000	4,076	2,130,000	3,444	1,276,000
1965	7,002	15,787,000	5,053	9,168,000	N/A	3,592,000	1,617	698,000	358	76,000
1960	4,836	8,395,000	3,085	4,426,000	N/A	N/A	198	46,000	N/A	N/A

N/A Not available.

a Figures include retirement, disability, and survivor pensioners.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data;" Ontario Ministry of Treasury, Economics and Intergovernmental Affairs; actuarial and annual reports.

The growth of membership in HOOPP, which has been more than four-fold since it was established in 1960, and in OMERS, which has increased by a roughly similar percentage since 1965, partly reflects the expansion of these plans to include new employer participants. For this reason, and also because they are relatively new plans, changes in the proportion of pensioners to active members are not of great significance.

By contrast, in the PSSF and TSF, which are long-established plans, and which together account for almost half of the total membership of public sector plans, the figures are more meaningful. In each case, the growth of active membership basically reflects the growth of employment; while growth in the number of pensioners reflects both demographic changes and changes in the provisions of the plans which have made it easier to qualify for a pension. The data show that in both plans, the percentage increase in the number of pensioners has been considerably greater than the increase in the number of active members. In the PSSF, the percentage growth in the number of pensioners since 1960 has been more than twice that of the number of active members (431 per cent versus 170 per cent), while in the TSF the number of pensioners has risen at a rate almost twice as fast as the number of active members (292 per cent versus 190 per cent). As a result, in the PSSF, the number of retirees as a percentage of active members increased from 5.7 per cent in 1960 to 14.2 per cent in 1977, while in the TSF it rose from 7.3 per cent in 1960 to 11.3 per cent in 1976.

Funds

Table 13 shows the size and annual growth of the various funds from 1965.

Table 13
Ontario Public Sector, Size and Growth of Funds, 1965 to 1976

	1965	1970	1971	1972	1973	1974	1975	1976	1977
	(Thousands of dollars)								
PSSF(a)									
Size of fund at start of year	173,329	326,722	369,163	432,031	506,489	594,082	685,032	794,042	941,604
Balance at end of year	197,059	369,163	432,031	506,489	594,082	685,032	794,042	941,604	1,128,654
Annual growth rate(b)	13.7	13.0	17.0	17.2	17.3	15.3	15.9	18.6	19.9
TSF(c)									
Size of fund at start of year	330,573	679,474	778,612	896,171	1,041,171	1,183,400	1,405,616	1,689,704	1,946,882
Balance at end of year	372,673	778,612	896,171	1,041,171	1,183,400	1,405,616	1,689,704	1,946,882	2,325,163
Annual growth rate (per cent)	12.7	14.6	15.1	16.2	13.7	18.8	20.2	15.2	19.4
Ontario Hydro(d)									
Size of fund at start of year	166,448	282,752	315,782	355,361	399,430	453,601	520,309	599,491	688,527
Balance at end of year	179,183	315,782	355,361	399,430	453,601	520,309	599,491	688,527	819,224
Annual growth rate (per cent)	7.6	11.7	12.5	12.4	13.6	14.7	15.2	14.8	19.0
OMERS(d)									
Size of fund at start of year	16,035	151,575	204,421	272,273	354,196	465,366	589,470	755,141	965,036
Balance at end of year	30,200	204,421	272,273	354,196	465,366	589,470	755,141	965,036	1,205,495
Annual growth rate (per cent)	88.3	34.9	33.2	30.1	31.4	26.7	28.1	27.8	24.9
HOOPP(e)									
Size of fund at start of year	35,349	113,046	133,965	164,511	200,217	244,565	299,260	368,990	469,429
Balance at end of year	46,244	133,965	164,511	200,217	244,565	299,260	368,990	469,429	595,324
Annual growth rate (per cent)	30.8	18.5	22.8	21.7	22.2	22.4	23.3	27.2	26.8

a Year ended March 31
b Net cash flow as a percentage of balance at end of period
c Year ended October 31
d Year ended December 31
e Year ended June 30 for 1965-1969 and December 31 thereafter; figures for 1976 obtained from actuarial report as at December 31, 1976.

Sources Public Accounts, Annual Reports, Ministry of Treasury and Economics

A number of plans, including OMERS, were unable to provide information on the amount of pensions paid in any year of the plan's operation, and only a few were able to provide data on the growth in pension payments since 1960. Data supplied by the latter show that increases since 1960 have been substantial; e.g., in the PSSF, pension payments rose from $4.4 million in 1960 to $65.4 million in 1977-78, while in the TSF payments increased from $8.4 million to $116.5 in 1977. These increases are basically the result of growth in the number of pensioners and in the earnings on which new pensions are based, rather than of changes in the provisions of the plan. They perhaps can be seen in context if they are related to current pensionable payroll. In 1977, PSSF pension payments were equivalent to 5.7 per cent of pensionable payroll, while in the TSF the figure was 7.0 per cent. In 1971 - the earliest date for which pensionable payroll figures are obtainable - the figure for the PSSF was 4.7 per cent, and the TSF figure was 5.6 per cent.

From information provided on number of pensioners and total amounts paid, it is possible to obtain some indication of how average pensions compare in the different sub-sectors. It must be added, however, that these averages reflect many factors and one cannot conclude on the basis of these figures, that one plan is "better" or "worse" than another.

Factors that may account for variations in average pensions are:

- Differences in the proportion of persons receiving retirement, disability, and survivor benefits in the various plans. (The averages include all pensions.)

- The proportion of long-service employees among those who qualify for pensions, which may vary according to the length of time plans have been in operation and also according to differences in termination rates, vesting provisions, opportunities to receive credit for past service, etc.

- Previous rates of increase in the number of new pensioners: plans which have a high proportion of recent retirees among their pensioner population will have higher average pensions - other things being equal - than those which have registered a slower growth in number of pensioners, since earnings have risen rapidly since the early 1970s, and also because those receiving survivor pensions could be expected to represent a relatively small proportion of the pensioner population.

- The average earnings of employees prior to retirement: plans which have a high proportion of managerial and professional employees among their members could be expected to have higher than average pensions.

- Differences in benefit formulas, including differences in cost-of-living adjustments.

Although it is not possible to isolate the effect of these different factors, in a few plans the impact of some of them is evident. For example, the highest average pension paid in the public sector in 1977 was to former members of the Legislative Assembly, which might be attributed to the fact that they have higher than average earnings and a much higher benefit rate per year of service than others, with no reduction for CPP. The relatively high average pension paid to teachers would appear to reflect three factors: they have higher earnings at the time of retirement than many other occupations; they tend to stay in the same job on a career basis and so acquire more years of continuous service; and their retirements have grown rapidly in recent years. At the other extreme, the low average pension paid by HOOPP can be attributed primarily to the relatively recent introduction of this plan, though the failure to make any cost-of-living adjustments in recent years has also held down the level of pensions compared with that of other plans.

While it is possible to draw some tentative conclusions from these figures, the danger in doing so is illustrated by figures provided by the TSF, WCB, and Hydro plans, which were the only ones to supply data on the number of persons receiving different types of pensions and the amounts paid. The table below shows the proportion of pensioners receiving retirement, survivor, and disability pensions in each of these plans and the average amounts paid. The most striking differences are the lower proportion of pensioners receiving retirement pensions in the Hydro plan, (we would assume this to be the result of slower growth in the pensioner population in recent years) and the much higher average retirement pension paid by that plan, which can be attributed mainly to the fact that Hydro employees have a long average pensionable service when they reach retirement age. The effect of such differences on average pensions is indicated by the fact that if the proportion of pensioners receiving each type of pension were the same in the Hydro plan as in the TSF, the average Hydro pension would be over $9,000 rather than $4,930.

Table 14
Ontario Public Sector, Proportion of Pensioners and Average Pension by Type of Pension, 1977

	Retirement		Survivor		Disability		Total	
	Per cent of pensioners	Average pension	Per cent of pensioners	Average pension	Per cent of pensioners	Average pension	Per cent of pensioners	Average pension
		(Dollars)		(Dollars)		(Dollars)		(Dollars)
TSF	83.0	6,601	9.6	3,413	7.4	4,403	100.0	6,139
WCB	76.7	4,376	21.9	2,248	1.4	3,002	100.0	3,891
Hydro	49.7	10,145	40.9	2,232	9.4	5,659	100.0	4,930

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Very few plans were able to provide data which would make it possible to trace changes in average pensions since 1960. Of those that did, only three were major plans: PSSF, TSF, and HOOPP. The figures for HOOPP cannot be meaningfully compared with those of other plans, since HOOPP was established in 1960. In the PSSF, the average pension rose from $1,435 in 1960 to $3,999 in 1977, which translates into a percentage increase somewhat lower than the rise in average earnings over this period. In the TSF the increase was greater - from $1,736 in 1960 to $6,139 in 1977. Analysis of the data shows that the increase in TSF pensions relative to those paid by the PSSF began about 1965 and has been fairly gradual since then, suggesting that it may be the result of changes in relative earnings over this period. However, as we have indicated, any conclusions based on comparisons of average pensions would have to be considered speculative. Future growth rates and their cost implications are considered in Chapter 5.

NOTES

(1) R.S.O. 1970, c. 387 as amended.

(2) R.S.O. 1970, c. 455 as amended.

(3) R.S.O. 1970, c. 324 as amended.

(4) R.S.O. 1970, c. 21 as amended.

(5) R.S.O. 1970, c. 241 as amended.

LIST OF TABLES

Table 1 - Ontario Public Sector Active Pension Plan Membership, by Age Group and Sex, December 1977 3
Table 2 - Ontario Public Sector, Percentage Distribution of Active Membership by Age and Sex, 1977 4
Table 3 - Ontario Public Sector, Percentage Distribution of Active Membership by Length of Service, 1977 5
Table 4 - Ontario Public Sector, Average Years of Pensionable Service by Age and Sex, 1977 6
Table 5 - Ontario Public Sector, Percentage of Active Membership With 10 or More Years of Service, by Age Group, 1977 7
Table 6 - Ontario Public Sector, Rates of Termination, by Years of Service, 1977 10
Table 7 - Ontario Public Sector Employees Covered by Various Vesting Provisions, 1977 12
Table 8 - Ontario Public Sector, Distribution of Pensioners by Age and Sex, as of December 1977 13
Table 9 - Ontario Public Sector, Pensioners by Type of Pension 16
Table 10 - Ontario Public Sector, Total Payments to Pensioners 1977 (Retired, Disabled, Survivors) 17
Table 11 - Ontario Public Sector, Number of Members of the Five Major Pension Plans, 1960-1977 18
Table 12 - Ontario Public Sector Major Pension Plans, Number of Pensioners and Total Payments to Pensioners, Selected Years, 1960-1977 19
Table 13 - Ontario Public Sector, Size and Growth of Funds, 1965 to 1976 21
Table 14 - Ontario Public Sector, Proportion of Pensioners and Average Pension by Type of Pension, 1977 24

LIST OF CHARTS

Chart 1 - Ontario Public Sector, Distribution of Pensioners by Age and Sex, December 1977 15

Chapter 2

Plan Features

INTRODUCTION - THE ORIGINAL PUBLIC SECTOR PLANS

The first formal retirement arrangement for the organized civil service in this country came in 1870 for federal civil servants and was entitled, "An act for better ensuring the efficiency of the Civil Service of Canada, by providing for the superannuation of persons employed therein, in certain cases."(1)

It was some 50 years later that teachers(2) and public servants(3) in Ontario had formal pension arrangements and before the Power Commission Act was amended(4) to provide pensions for hydro workers. The next major thrust for large public sector plans did not come until the early 1960s when the need for portability caused an amalgamation of smaller plans covering hospital workers and municipal employees. The year 1960 saw the establishment of the Hospitals of Ontario Pension Plan(5), and in 1961-1962 legislation was passed to set up an OMERS umbrella plan for the employees of municipalities throughout the province.(6)

Of the 127 or more pension plans in the public sector today, there are five major plans: the Public Service Superannuation Fund (PSSF), Teachers' Superannuation Fund(TSF), Ontario Municipal Employees' Retirement System (OMERS), Hospitals of Ontario Pension Plan (HOOPP), and Ontario Hydro. Membership of the five major plans constituted 10.4 per cent of the Ontario labour force and 84 per cent of total active membership of plans in the Ontario public sector in 1977.(7)

Today, virtually all regular full-time employees are required to belong to their pension plan. Most plans specify immediate coverage (e.g., PSSF, WCB, and TSF) but some have various age and service requirements before joining. At Queen's University for example, membership is mandatory at age 30, while the University of Waterloo has a

compulsory membership age of 35. The few service requirements that exist do not exceed six months, presumably because that is long enough to cover the period of highest turnover, especially that of probationary employees. HOOPP requires participation after two years' service, although employees with six months' to two years' service may join. The TTC plan specifies six months' service as a condition of eligibility; the Ontario Hydro and Ontario Northland Transportation Commission (ONTC) plans require six months' service for selected employees. In plans that have age requirements, on the other hand, some employees may have several years of service before being eligible to join the plan. A number of university money-purchase plans (including those with "minimum guarantee" provisions) have such restrictions. These plans provide for matching by the employer of the individual employee's contributions, and permit the transfer of double the employee's contributions to another employer's plan or an RRSP if the employee terminates. The exclusion of younger employees from plan membership, therefore, can be explained by the high cost that the employer would incur if they were allowed to join and took advantage of the opportunity. In many defined benefit plans, by contrast, the employer makes little or no contribution on behalf of individual employees who terminate before they are 40 years of age, and younger employees who enter the plan help to hold down the employer's cost.

Uncovered Employees

In addition to those excluded because they do not meet age or service requirements, other employees are ineligible for pension coverage because of their lack of regular or permanent employee status. They are part-time, casual, or seasonal employees.

Part-time Employees

These employees work 24 hours per week or less. The Ontario Labour Relations Board uses a 24-hour demarcation to determine whether individuals should be members of bargaining units. This definition appears to be the basis for classifying employees as full-time for the purpose of establishing eligibility for pension plan coverage in HOOPP and the community colleges plan. In other plans a part-time employee is one who regularly works anything less than the normal full-time schedule.

Casuals

These are persons who work on an "as required" basis and include temporary replacements or persons hired for short-term projects. Casual employees may work on a full-time or part-time basis.

Seasonal Employees

These are people who work in jobs that are available only in a certain period each year, including jobs related to tourism or recreational

activities. Seasonal employees may be full-time or part-time and may be employed on a continuing or casual basis.

The TSF permits coverage of teachers who work a minimum of 20 days a year; the University of Toronto pension plan permits coverage of part-time academic employees who earn a specified minimum.(8) HOOPP and the Colleges of Applied Arts and Technology plan (CAAT) cover employees who regularly work more than 24 hours a week. The OMERS plan provides for coverage of employees "deemed" to be full-time, though this discretionary provision is used mainly to provide for coverage of non-teaching staff of boards of education who regularly work a 10-month year. Kingston General Hospital is unique in having a separate plan for designated part-time employees; however, there are only nine active members in the plan - a small percentage of the hospital's part-time employees.

In an attempt to identify how many employees are not covered by public sector pension plans, Dr. Kelly asked plan sponsors to provide:

a) the number of male and female employees who were eligible to be members of the plan as of December 31, 1977 but who chose not to join; and

b) the number of employees who were not eligible to become members of the plan.

They were also asked to provide a separate breakdown by sex for full-time and part-time employees.

Responses to these questions were of limited value because few employers were able to provide the requested information and because it was not clear how full-time and part-time employment were defined by the respondent or what the reasons were for the exclusion of full-time employees. The provincial government reported that a total of 5,231 full-time employees and 4,392 part-time employees were not covered by the PSSF, figures which can be related to a total active membership of 76,712. In this case it appears that part-time employees are persons who regularly work fewer hours per week than the scheduled full-time number; excluded full-time employees are mainly persons who work on a seasonal basis. Ontario Hydro reported a total of 976 uncovered full-time employees and 41 part-time employees. The number of uncovered full-time workers is equivalent to about five per cent of the plan's active membership; presumably it reflects both the exclusion of probationary employees and the fact that members of the Office and Professional Employees International Union are ineligible until they have been employed for 6 months. In the TTC, which also excludes employees from plan membership until after they have been employed for 6 months, 241 male and 32 female full-time employees were not covered by the plan, the combined figure representing about 3 per cent of the total active membership. The effect of age requirements for membership

was evident in figures provided by York University, which showed that somewhat more than half of the university's full-time employees were not covered by the university plan. Membership in the plan is not compulsory until age 30, though employees may elect to join between 25 and 30. It was not possible in this case - or in the case of any other plan which provides for optional membership up to a certain age or length of service - to identify the proportion of eligible employees who chose to join the plan.

The figures for teachers who taught less than 20 days a year in 1977 were not available. No information was obtained about employees not covered by HOOPP or by other hospital plans; the number could be expected to be larger than in other sub-sectors, partly because full-time employees are not required to join until after they have been employed for two years and also because there is a large number of regular and casual part-time employees in hospitals. Some indication of the gap in coverage may be obtained by comparing active plan membership in the Ontario health sub-sector in 1977 - 64,046 - with employment figures reported by Statistics Canada which showed that, as of December 31, 1975, there were 96,596 full-time and 23,557 part-time personnel employed in Ontario public hospitals.

Relatively few concerns were expressed about eligibility for membership in public sector plans. The issue of eligibility was primarily one of covering part-time workers. For example, this was a primary concern of the Ontario Nurses Association since none of the plans under which nurses are covered allows part-time employees to join. While part-time nurses receive a monetary allowance in lieu of fringe benefits (vacations, paid holidays, sick leave, etc.) this can be as little as 6 per cent of salary and cannot be said to represent compensation for loss of pension coverage. The ONA recommended that regular part-time employees be provided, through legislation, with the opportunity to participate in pension plans after a minimum hourly service requirement. A similar recommendation was made by CUPE, noting that the ERISA legislation in the United States defined part-time employment on the basis of number of hours worked. Also critical of the fact that part-time employees are not eligible for plan membership was the York University Faculty Association. Many part-time faculty members work year after year, and many who work full-time are classified as part-time because they work in more than one department.

The only reason advanced for the exclusion of part-time employees from pension plans was that it would be administratively difficult to cover them, especially in final average plans. However, provisions established under OMERS and the TSF indicate that coverage is feasible, even under final average plans. OMERS gives credit for years of service on a pro rata basis, with pensionable earnings calculated as an annualized figure of the employee's contributory earnings. Thus, if a person worked regularly an average of 50 per cent each year to age 65, he or she would receive a pension equal to half the amount which would have

been earned for full-time service. In the TSF, part-time teachers accrue pension service on the basis of the ratio of their earnings to those of an equivalent full-time teacher. If earnings are not annualized, this could result in a significant drop in pension benefits for a teacher who switches from full-time to part-time employment in the years prior to retirement. The OMERS approach appears to be the more equitable one, although it might be administratively troublesome and costly without some minimum service requirement in each year of employment. This provision appears to have been used mainly for non-teaching employees in schools who work a ten-month year, and for elected officials.

Compulsory Membership

The general view seemed to be that compulsory membership is necessary to ensure that employees do have adequate protection and to assure the financial stability of pension plans. The OTF proposed that supply teachers be given the option of joining the TSF rather than being required to contribute. Voluntary membership is being sought by faculty in some universities, while one university group confirmed that there was some questioning, especially among younger employees, about the need to belong to pension plans.

BENEFITS

Retirement Benefits

With respect to benefit design, the five major plans have always been defined benefit plans, although with somewhat different formulas. The Teachers' and PSSF were both final average earnings plans, with the Teachers' benefit being 1/60 of the average salary for the last 10 years multiplied by the number of full years of service. Until changed by legislation in 1947, the PSSF pension was calculated as 2 per cent of the average of the last three years' salary multiplied by years of service (to a maximum of 30). The Hydro plan used an average best earnings formula and was 1/80 of the average salary in the highest five consecutive years multiplied by service, with a minimum pension of $365 per year. HOOPP and OMERS were both career average earnings plans set at 2 per cent of contributory earnings multiplied by years of service.

Today, some of the smaller plans are money-purchase, but these cover only 7,218 members. The Toronto Transit Commission has a career average plan for its 8,048 members which is updated from time to time. Otherwise, the incidence of the career average formula is negligible. Some university plans are a combination of money-purchase and final earnings.(9)

Although there is considerable diversity in the retirement benefits paid by public sector plans, variations among the largest plans are

relatively minor. The PSSF, WCB, OMERS, HOOPP, TSF, Hydro, and CAAT all provide a benefit of 2 per cent of final average wage or salary for each year of service, less CPP offset, to a maximum of 70 per cent. The TSF and CAAT plans use the best seven years' average salary; OMERS, HOOPP, PSF, and Hydro, the best five years' average wage or salary. The WCB plan bases benefits on the best three years' salary for service prior to 1966. WCB is exceptional in permitting overtime payments to be included in the calculation of final salary.

A number of other plans provide benefits much the same as those referred to above. For example, the Ontario Northland Transportation Commission (ONTC) has a benefit similar to that of Hydro, except for a slightly higher CPP offset; and a few university plans have benefits of 1.3 or 1.5 per cent of final average salary up to the YMPE and 2 per cent above. Most of the others may be classified as "significant variations." Queen's University and six other universities have money-purchase plans which contain a minimum guarantee of 1.3 per cent of final 5-year salary up to YMPE and 1.75 per cent above. The Ontario Cancer Institute plan is another which follows this approach. The University of Toronto, McMaster University, and the University of Guelph provide benefits which are lower for years of service prior to age 45 than following it. University plans show other variations too. In some, the combined private plan-CPP benefit is a higher percentage of earnings up to the YMPE than above it, while in others the reverse is true. Again, in contrast to general practice, most apply the CPP offset for years of service prior to 1966. The McMaster University plan for hourly-rated employees is the only non-contributory plan in the public sector. It provides a flat-rate benefit per year of service. Notable variations among non-university plans include the updated career average benefits provided by the TTC plan and a few of the closed municipal plans.

Adjustments for Inflation

A majority of those receiving pensions from public sector plans have received some kind of pension adjustment to compensate for increases in the cost of living in recent years. Generally, corresponding adjustments have also been made to deferred pensions of terminated employees.

Although in many cases cost-of-living increases have been made on a regular annual basis, such increases are provided for automatically in only a few cases, most notably in plans covered by the Superannuation Adjustment Benefits Act. Plans covered by that act, which provides for increases up to a ceiling of 8 per cent in any year, are the PSSF, TSF, Ryerson Pension Plan, and the Caucus Employees Retirement Plan. The cost of adjustments is contributed to equally by employees and employers, the current contribution rate being one per cent of salary from each.

Employees in plans which have granted post-retirement pension adjustments account for 85.1 per cent of plan members in the Ontario public sector, most of the remainder being members of HOOPP.

Table 1 gives the number of pensioners who received cumulative percentage increases in the ranges shown for the years 1971-78. The percentage increases may be compared with an increase of 65 per cent in the Consumer Price Index over the period 1970-1977.

Table 1
Ontario Public Sector Percentage Increases in Post-Retirement Pensions, by Sub-sector and Percentage Range, 1971-78

Sub-sector	Range			Flat dollar increase	Total
	6-20%	20-35%	35-46%		
Provincial government	-	358	16,376	-	16,734
Municipal	1,569	2,172	15,266	765	19,772
Health	-	374	-	-	374
Education	1,456	674	19,197	-	21,327
Provincial utilities	-	4,117	-	920	5,037
Legislative assembly	-	76	-	-	76
Total	3,025	7,771	50,839	1,685	63,320

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

The cumulative percentage for each plan is given in Table 2, with an indication as to whether adjustments have been on a regular annual or an ad hoc basis. Some plans have made both regular annual adjustments and additional ad hoc supplements from time to time. Until 1975, inflation adjustments in the public sector were usually made on an ad hoc basis, though in many cases adjustments were regular and expected. In the case of Hydro, for example, ad hoc adjustments were made from 1971 to 1975 to the same extent as for the PSSF. Since that time adjustments have been made each year, at half the rate of adjustment to the PSSF. Some plans, notably HOOPP, have had no inflation adjustment on any basis.

Table 2
Ontario Public Sector Post-Retirement Pension Increases, by Sub-sector, Cumulative Increase and Type of Increase, 1971-78

Sub-sector	Cumulative increase	Regular annual	Ad hoc
	(Per cent)		
Provincial government			
PSSF	46	x	
WCB	20		x
Municipal government			
OMERS	38		x
Metro (employees)	38		x
Toronto (employees)	35.7		x
Toronto firemen	31		x
Borough of York	15		x
Hamilton-Wentworth	15% + flat increase from 1976		x
TTC	15		x
Ottawa/Carleton Transportation Commission	$468 average + 24%	x	x
London Transportation Commission	$152		x
Health			
Ontario Cancer Institute	24		x
Hospital for Sick Children	30		x
Education			
TSF	46	x	
Ryerson Polytechnical Institute	40	x	
CAAT	26		x
Universities:			
Queen's University	25	x	x
Trent University	16	x	
University of Ottawa	16	x	
York University	16	x	
Wilfrid Laurier University	16	x	
University of Western Ontario	15	x(optional)	x
Laurentian University	24	x	
McMaster University	11.4	x	
Carleton University	16	x	x
University of Toronto	6		x
Waterloo University	38	x	
Guelph University	21		x
Windsor University (academic)	16	x	
Provincial utilities			
Ontario Hydro	28		x
Ontario Northland Transportation Commission	12% + $180		x
Legislative assembly			
Legislative assembly	25		x
Caucus employees	N/A	x	

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

The percentage of pensioners who received post-retirement adjustments in each of the sectors is as follows:

Provincial government	99.1%
Municipal government	98.8%
Health	4.3%
Education	97.7%
Provincial utilities	100%
Legislative assembly	100%

The public sector study by Dr. Kelly showed that post-retirement adjustments were some of the most frequently-discussed issues, much of the discussion arising from the lack of automatic adjustments in OMERS, HOOPP, the Ontario Hydro Pension Plan, and most university plans. Criticism was strongest in relation to HOOPP. Whereas OMERS, Ontario Hydro, and a number of universities have made ad hoc adjustments in recent years, HOOPP has not made any adjustments.

It was the view of employee groups that formal escalation should be incorporated into HOOPP, OMERS, and the other public sector plans that do not presently have such provisions. It was suggested by OCUFA and the University of Toronto Faculty Association that, for universities, the most promising mechanism available for realistic pension indexing was the Superannuation Adjustment Benefits Act. Plans eligible to participate under SABA are those for which funds for the plan come directly or indirectly from the Consolidated Revenue Fund of the Province of Ontario. If universities were eligible, this could provide a province-wide link between university pension plans and others such as the Teachers' Superannuation Fund.

Only a few of those advocating the indexing of post-retirement benefits expressed definite views on the question of how this should be financed. The OTF was strongly opposed to a fully-funded approach; it was optimistic that the rate of inflation would decrease, in which case the plan would be overfunded. OPSEU opposed a type of funding recommended in the recent Cofirentes Report in Quebec, under which excess interest earned by the fund assets would be used to finance adjustments. More acceptable approaches, said the union, would be a pay-as-you-go system or one based on indexed government bonds, as outlined in recent studies by Professor Pesando. The University of Guelph Staff Association suggested a novel way of funding which would involve graded contributions by active members based on age and salary, with a maximum of 2.5 per cent of salary for people close to retirement and contributions by retirees of 1 per cent of their pensions.

Commenting on the issue of indexing from an employer standpoint, Mr. W.G. Johnson of Ontario Hydro stated that the organization he represented had close links with the private sector, and a contractual commitment could have a longer-run effect on the cost of power. There was also a question of principle involved, since in the corporation's

view the unions with which it bargains on pensions do not represent retired workers. The Ontario Hospital Association, in a submission to the Commission, stated that the cost of indexing is more than it has been able to afford. The OHA has held to its long-term conviction that proper funding should be maintained, and has resisted the attraction of trying to gain short-term popularity by adding benefits on a pay-as-you-go basis.

The Ontario Municipal Retirees Organization (OMRO) commented on a recent change in policy by OMERS with regard to pension adjustments. Although OMERS had made regular ad hoc adjustments in recent years, pensioners recently received an announcement from the board stating that it had recommended to the government that the 3 per cent increase in pensions effective in March 1978 be the last increase payable unless some other means of providing the funds to pay pension increases were developed. OMRO stated that this was the result of the recent switch from an updated career average to a final average plan. Prior to that change, OMRO had expressed its concern to the OMERS administration that a move to a final earnings plan might jeopardize the ad hoc increases which had been awarded to pensioners; but it had been repeatedly assured that its fears were groundless.

The funding of indexing is discussed in Chapter 3.

Survivor Benefits

Survivor or death benefits are provided throughout the public sector and have been available from the outset in the five major plans. Survivor or death benefits may be paid before or after retirement. Where an employee dies before retirement and before vesting, the general practice is that the employee's contributions are returned with interest. The PSSF and the University of Toronto are exceptions in that they provide for a refund of twice the employee's contributions if the employee had eligible dependents. Other exceptions are Queen's University, which provides for a return of twice the member's contributions plus interest, and the University of Western Ontario which provides for a return of the member's contributions plus the employer's contributions.

Where an employee dies after vesting and before retirement, the most common practice is to provide a benefit of 50 per cent of the accrued pension where there are survivors (eligible spouse or eligible dependent children) and to refund the member's contributions with interest where there are no survivors. OMERS is an exception; it provides a survivor benefit of 50 per cent of the accrued pension to the spouse, and 10 per cent for each child under 21 to a maximum of 25 per cent. Alternatively, the surviving spouse may elect to take a refund of contributions instead of a pension. Others which show variations are the Toronto Fire Department Superannuation Plan and the Metro Toronto Police Plan, which provide half the accrued pension if the spouse is the

beneficiary, or if the spouse is not the beneficiary, a return of the member's contributions with interest plus $100 for each year of service. A somewhat similar provision exists in the Toronto Civic Employees Pension Plan.

In the case of death after retirement, the general policy is to provide half the pension to specified survivors. A few plans provide a joint and last survivor option, that is, a pension (annuity) payable after the death of the pensioner or annuitant during the life of a surviving spouse, or an option under which the pension is guaranteed for a certain number of months. When there are no eligible survivors, the policy in most cases is to grant a return of the member's contributions less pension payments made.

Survivor benefits provided through pension plans have to be considered in conjunction with benefits available to employees through group life insurance plans. Nearly all public sector employers require employees to have a certain amount of employer-paid or employer-subsidized life insurance; most offer additional voluntary insurance, usually employer-subsidized. In a few cases the amount of compulsory insurance is a specified dollar amount: for example, $2,000 for Toronto Civic and Metro Toronto employees; $5-15,000, depending on service, for TTC employees; $9,000 for unionized employees of ONTC. More commonly it is a multiple of salary, ranging from 75 per cent of salary in the PSSF to as much as three times salary in some school boards and municipalities. Occasionally, the amount of compulsory insurance varies with occupational or marital status; e.g., the Hospital for Sick Children provides life insurance of 1-1/2 times salary and three times salary for department heads and above, while ONTC provides one times salary for single employees and twice salary for married employees.

The amount of additional voluntary insurance available to employees ranges from one to three times annual salary (occasionally subject to a maximum dollar amount) but in no case does the amount of combined compulsory and voluntary insurance exceed four times salary. Most often, the additional insurance is subsidized by employers, in amounts ranging from 50 to 80 per cent. However, there are notable exceptions. In the PSSF, where employees may opt for additional insurance of up to three times salary, the premiums are employee-paid. Employees of the WCB pay the cost of additional voluntary insurance of up to two times salary, based on their age when they enter the plan. The cost of the plan recently introduced for hospital employees will also be borne by those who elect to participate. Some other variations are: the Ontario Hydro pension plan, in which additional employer-subsidized insurance includes an optional paid-up portion of up to two years' salary; the Queen's University plan, which offers employer-subsidized insurance of up to three times salary for those with dependents, and one times salary for single employees; and the McMaster University plan, which includes an option for married employees of one times salary, plus survivor income of 25 per cent of salary and 5 per cent for each dependent child

up to three. (The latter's pension plan provides only for a return of the member's contributions plus interest in the case of death prior to retirement).

The amount of life insurance available to employees following retirement is considerably lower. In some cases, no insurance is provided, and in nearly all other cases the amount is nominal. The PSSF provides insurance of $2,000 during the first year of retirement, $1,750 in the second year and $1,500 thereafter. The WCB provides $2,000 for employees hired prior to 1972; HOOPP provides a similar amount for those with at least 10 years' service ($200 per year of service for others). For teachers, the amounts vary among school boards. There are variations too among municipalities, with a maximum of $5,000. Ontario Hydro, which includes paid-up insurance among the options available to employees, has an average paid-up policy of $10,000-$12,000.

Disability Benefits

Public sector plans generally provide disability benefits which have been a feature since the beginning. Final average earnings plans and updated career average plans in the public sector generally provide for payment of the full accrued pension in case of total disability if the employee has at least 10 years' service. Exceptions are OMERS, which has no service requirement for this benefit, and HOOPP, which requires that the employee have 10 years service and be age 45 or more. Under HOOPP the accrued pension is reduced by 3 per cent for each year below age 62. OMERS and TSF provide pensions for partial disability. The Teachers' plan provides that, when a contributor is disabled for teaching purposes but not for employment in other professions, the pension is reduced by 2.5 per cent per year for each year below age 65 to a maximum reduction of 25 per cent.

The use of disability provisions in public sector pension plans is decreasing as groups become covered by long-term disability insurance - frequently with a provision that pension credits continue to accrue while the employee is disabled. Generally, the long-term disability benefit is a fixed percentage of salary: PSSF 66-2/3 per cent; WCB 66-2/3 per cent; HOOPP 60 per cent; and Hydro 60 per cent. Queen's University provides a benefit which is a declining percentage of salary: 65 per cent on the first $7,200; 55 per cent on the next $10,800 and 40 per cent on the balance of annual salary.

Benefit Levels

Only a few organizations proposed that improvements be made in the formula used to determine pension levels at retirement. The Ontario Teachers' Federation recommended that teachers' pensions be based on the best 5 years' earnings, rather than the best 7, which would bring the formula into line with that used in the PSSF, HOOPP, OMERS, and Hydro plans. The Ontario Provincial Firefighters' Association proposed that

the OMERS formula, as it relates to firefighters, be changed from 2 to 2.33 per cent of final average earnings per year of service because more firefighters are retiring at age 60 without earning a 70 per cent pension. The OPFA's proposal that the current maximum pension be provided after 30 years' service also implies a 2.33 per cent benefit per year of service. The University of Toronto Faculty Association indicated that it would seek changes in the university plan's formula which provides lower pension benefits in respect of service up to age 45 than for later years. None of those indicated that they would want to be covered by a different type of plan (money-purchase or defined benefit) than that to which they currently contribute.

Improvements in the level of survivor benefits were recommended by several organizations and individuals. The Quarter Century Club of the Ontario Public Service, noting that the 50 per cent benefit paid to a surviving spouse had proved inadequate for some of its members, recommended that an option be made available whereby individuals could draw less than 100 per cent of their pension entitlement on retirement in order that the surviving spouse could receive a higher percentage. OPSEU also criticized the 50 per cent formula, as did Mr. C.G. Millard, Manager of Personnel Services, Northern College of Applied Arts and Technology. Mr. Millard recommended that the level be two-thirds of the pension instead of one-half and that the OMERS provision which reduces the survivor's pension if the spouse is more than 10 years younger than the plan member be eliminated.

An opposing view was expressed in a submission by the Management Employees Group. The MEG commented that improved survivor allowances would impose an additional financial burden on the PSSF, that many single contributors would not favour such a change, and that improved survivor protection could be achieved by a life insurance program which would be more flexible to individual needs without adverse impact on the PSSF.

Improved survivor benefits were a concern of the OPFA, which recommended that an insurance fund be set up to pay $50,000 to the survivor of a firefighter killed on duty, in addition to other benefits. Ideally, the Firefighters' Association would like this benefit to be brought in through federal legislation, as in the United States.

The broader question of whether survivors' and disability benefits should be part of a pension plan, rather than being provided through separate insurance plans, was raised with a number of groups during the discussions with Dr. Kelly. The general view seemed to be that since single employees may not benefit equally from these provisions, and since they do not ensure an adequate level of benefits, especially for younger contributors and their dependents, there might be advantages in providing one or both forms of protection through group insurance programs. The OTF said that before this step was taken it would like a body such as the Pension Commission of Ontario to look into it care-

fully. Both OPSEU and MEG noted that there was no survivor benefit for death after retirement outside the pension plan, so this would probably have to remain part of the plan in order to meet that need.

Maximum Benefits

Most public sector employees in Ontario are covered by pension plans which provide a maximum retirement benefit of 70 per cent of the best 5 or 7 years' salary, less a CPP offset for service since 1966. For two reasons, neither of these formulas results in a uniform or constant percentage of salaries at the time of retirement. First, the pension as a percentage of the employee's salary just prior to retirement will depend on the general rate of increase in salaries in the previous 5 or 7 years determined basically by the rate of inflation) and on whether the increases received during this period were higher or lower than average. The significance of this may be illustrated as follows: If we assume annual salary increases of 6 per cent during the five years prior to retirement, the pension will be approximately 62 per cent of the final salary compared with 70 per cent of the final 5-year average; whereas if we assume salary increases of 10 per cent, the percentage of final year's salary will be 58 per cent. In a plan providing a maximum pension of 70 per cent of final 7-year average salary, the corresponding percentages would be 58 per cent and 53 per cent. The second reason for difficulty in relating these maximums to final salaries is that, in addition to variation between plans in the CPP offset formula, the amount of offset increases each year, mainly because it applies to an increasing number of years of service but also because of increases in the YMPE. For a person retiring in June 1978, the CPP offset under the PSSF formula would amount to $816 a year, which is equivalent to 35 per cent of the maximum CPP pension. In the TSF, the offset would amount to $910; in HOOPP the reduction would be $700.

Two illustrations serve to give a rough indication of the amount of pension income that would be received from the PSSF and CPP by someone retiring in 1978 who had 35 years' pensionable service. It is assumed in the first case that the individual's salary at retirement was $12,000, with a final 5-year average of $10,000. In the second case, the figures are $24,000 and $20,000 respectively:

Final year salary	$12,000	$24,000
Final 5-year average salary	10,000	20,000
Basic PSSF pension	7,000	14,000
PSSF pension after CPP offset	6,184	13,184
CPP pension	2,333	2,333
Total pension	8,517	15,517
PSSF pension after CPP offset, percentage of final year salary	51.5%	55.0%
Total pension as a percentage of final year salary	71.0%	64.7%

As the figures show, the PSSF pension less CPP offset represents a slightly higher percentage of final salary for the higher-paid employee, but the combined pension amounts to a higher percentage for the lower-income employee. If OAS payments were added to these figures (e.g., $164.74 a month) the differential in favour of the lower-paid employee would be even greater: 87.5 per cent compared with 72.9 per cent of final salary.

The CPP offset will eventually equal the amount of CPP pension paid. If that were the situation at the present time, total pension income (including OAS) in the above cases would amount to 74.8 per cent of final salary for the lower-income employee and 66.6 per cent for the higher-income employee. In these plans, however, integration is related in effect to that portion of the individual's service while the CPP was in existence - that is, from 1966. Offsets, although varying according to the different formulas, have relatively less effect where a retiree has a substantial amount of pre-1966 pensionable service. Those who have retired in recent years and those retiring for some years to come enjoy an advantage from this phasing-in of integration.

Probability of Obtaining Maximum Pension

The data on average benefit levels and pensionable service indicate that very few employees are likely to receive the maximum pension. There are various reasons, including changes in employment, permanent or temporary withdrawal from the labour market, and early retirement, all of which come into the category of "terminations." Although it is impossible to estimate with any precision the proportion of newly-hired employees who can expect ultimately to receive the maximum pension, a rough indication may be gained from the fact that, with an average annual termination rate of 4 per cent, only one out of four employees hired up to age 30 could expect to accumulate 35 years of service. Assuming a normal retirement age of 65, no one hired after age 30 would be able to do so. Data on pensionable service by age indicate that only a small proportion of those still employed at ages 60-64 - the age group in which average pensionable service is highest - could potentially receive the maximum pension (see Volume II, Chapter 8). In the provincial government service, no more than one out of nine employees in this age category would be able to do so. In education and provincial utilities the proportion is about one out of four. It is impossible to determine how many who cannot qualify for the maximum pension with their current employer might have pension income from previous employment elsewhere, or might at some point in the past have received a refund of contributions which, if invested, would have generated a retirement income.

As we have seen, final average plans favour not only those with long service but those who are employed up to retirement age. This result may be contrasted with the approach in money-purchase plans, in which the employer generally contributes an amount equal to that con-

tributed by each individual employee. If a vested employee terminates and double contributions are transferred to an RRSP or other plan, a return will be obtained which, on average, will be as great as if it remained in the fund to retirement age. While such plans provide lower benefits per dollar of contributions than final average plans, more terminating employees are likely to benefit from the plan.

Integration

In the PSSF, WCB, and OMERS, the benefit offset for CPP is .7 per cent of the final three-year average YMPE for each year of service since 1966. The offset formula in the TSF and CAAT plan is .7 per cent of the final year's YMPE. HOOPP has a CPP reduction of .6 per cent of the final three-year average YMPE, while Hydro reduces the benefit by .625 per cent of the final five-year average YMPE.

Those who expressed opinions on integration were opposed either to the principle of integration or to specific ways in which integration had been effected.

The OTF stated that teachers were opposed to integrating the CPP with the TSF but that it had been forced on them. However, the federation was not sure that teachers would now accept a stacked plan which would require a contribution rate of 6 per cent for the TSF plus 1.8 per cent or more for CPP plus 1 per cent or more for the escalation fund.

OPSEU maintained that de-integration would be advantageous to the low-income earners. At present, their contributions to the public sector plans only provide them with what they would be getting anyway from CPP. De-integration, the union said, should be done in a step-by-step fashion to minimize shocks to the fund.

Mr. A.W. Reeve of OMERS also expressed the view that employer pension plans should not be integrated with the CPP. The present system of integration, with the YMPE rising rapidly, was unfair to most employees. He added that because of the confusion about the costing of pension plans and the difficulty of explaining to employees their integrated entitlement, public sector employees might consider non-contributory pension plans with a flat benefit on top of CPP pensions.

CUPE was primarily concerned with the elimination of benefit step-rate and benefit offset methods of integration, an aspect which is discussed in detail in its brief to the Commission. More generally, it was noted that increases in CPP contributions could be expected to lead to a re-examination of the whole integration question by employers and unions, and possibly to an increase in the number of stacked plans.

The Ontario Confederation of University Faculty Associations (OCUFA) stated that the present integration formula created many prob-

lems, chief among them the fact that people do not understand how integration works. Therefore, the University of Western Ontario has stacked plans. University plans, according to OCUFA, should have been stacked to start with.

Comments on the subject of integration were also made by the Ontario Provincial Police Association which stated that it had been and still was in favour of stacking; by a number of employees of the Ministry of Health, who noted that CPP benefits were higher than PSSF benefits per dollar of contribution; and by the University of Guelph Staff Association, which was critical of the method of integration used for the staff pension plan. The association pointed out that the retroactive integration of benefits prior to 1966 was a windfall to the employer and contrary to the intention of the CPP.

Several problems arise from the integration of final earnings plans with the CPP.

1. Employees contribute a higher amount to their own plan on earnings above the YMPE than on earnings up to that level throughout their contributory period, but reductions in benefits for years of service since 1966 are based on the YMPE at the end of the contributory period. As noted by the CPP Advisory Committee, this has led to employee complaints that although they contributed to their own plan at the full rate of earnings during the early years of the CPP, their pension benefits with respect to these years of service are at the full rate only on earnings above a much higher YMPE at the time they retire. Because of the rapid catch-up increases in the CPP in recent years, a growing number of employees appear to have become concerned about this point.

2. Employees perceive the CPP benefit to be relatively more generous that that of the employer's plan. This is a result of different funding approaches. The public sector plans are funded plans, with a fixed ratio of benefits to contributions, while the CPP is a partially funded plan with a decreasing ratio of benefits to contributions. To date, the differences in benefit/contribution ratios have been substantial. For example, while the ratio of benefits to contributions in the PSSF amounts to .2968 on salary up to the YMPE and .3333 on salary above it, the CPP, for persons retiring in 1976 with ten years of service, provided a benefit equal to 1.5432 times contributions. This difference, however, will gradually diminish as integration matures, even if there is no increase in the CPP contribution rate. After 40 years, when the CPP is fully mature, the ratio of benefits to contributions will be .3858.

3. Employees perceive discrimination in benefits from the employer's plan in favour of the higher-paid employees. (In fact, the combined employer - CPP pension is a higher percentage of earnings for lower income employees than it is for those with higher earnings, and OAS makes the percentage differential wider still). A related point, although one that is not actually a result of integration, is that low-income employees, in contributing to an employment plan, are paying for a benefit which they could get from GIS or GAINS if they had no employment pension income.

4. Methods of integration are another problem area. There is considerable variation in public sector plans in the method of CPP offset, which affects the benefits which employees receive.

5. Possible future changes in the CPP would cause other problems. An increase in the CPP contribution rate would require higher contributions from both employers and employees without any corresponding increase in the total benefits. Since this would amount to a higher percentage of salary for those with earnings up to YMPE than for those with higher income, it might raise further questions about the apparent discrimination in favour of higher-paid employees in the employer's plan. An increase in CPP benefits, with or without any increase in contribution rates, might raise further questions about the role of private pension plans, especially for lower-income employees.

Although several employee groups indicated that integration was imposed on them against their wishes, there does not appear to be any general desire for "stacking" among public sector unions. Stacking certainly would solve the problems to which we have referred. However, it would mean higher contributions from employers and employees, which employers presumably would be reluctant to assume unless there were an offsetting reduction in some other component of compensation. It would be costly, therefore, for employees - more costly still if CPP contribution rates were raised. It might also leave employees with more pension benefits than they really need.

An alternative approach, favoured by some unions, would be to "de-integrate" or "de-couple" the plans. This would involve keeping the employer plan and the the CPP quite separate, but with no change in the total amount of contributions and benefits paid under each plan. All employees would contribute an equal percentage of salary to the employer plan and would get the same ratio of benefits to contributions. The effect of this would be to provide a somewhat higher combined CPP-employer plan benefit for lower-income employees than would be the case under an integrated plan, and a lower combined benefit for those with higher earnings.

RETIREMENT AGE

While age 65 is the normal retirement age in Ontario for 91 per cent of members in the private sector, it is the normal retirement age for only 51 per cent of public sector members. Although retirement pensions are paid at age 65, if the vesting conditions are met (usually 10 years' service) normal retirement may occur at other ages provided the retirement conditions are met. Normal retirement age is more properly considered as the earliest age at which one may receive an actuarially unreduced pension. This age is often earlier than age 65.

Provincial Government

PSSF and WCB provide for unreduced retirement benefit prior to age 65 when age plus service equals 90 points, and at age 60 with 20 years of service.

Municipalities

OMERS provides early retirement prior to age 65 in supplementary plans: one plan provides for an unreduced pension at age 60 and requires a contribution one per cent more than the basic plan. A second plan provides for retirement on an unreduced pension at age 50 after 30 years of service and within 10 years of normal retirement, at an additional contribution of 2 percentage points higher than the basic rate.

Employees may negotiate membership in these plans with each individual municipality as well as the amount of the employer subsidy. Generally firemen and policemen have taken advantage of these plans. The closed municipal plans also provide for early retirement. A recent arbitration award for Metro Toronto Police states that, on average, Metro Toronto Police retire at age 54.3 with an average service of 29.9 years. The normal retirement age for TTC employees is age 60, but employees may retire on an unreduced pension after 30 years of service with no age requirement.

Actuarially Reduced Pensions

Early retirement with actuarially reduced pensions is generally available to those who retire within 10 years of normal retirement age and do not meet the requirements for unreduced pensions. The reduction is normally about 5 per cent for each year by which retirement precedes the normal retirement age. Ontario Hydro is an exception in that the plan provides for a maximum reduction of 25 per cent at age 55 if the employee has 15 years of service. The TSF is also an exception to the general practice since the plan reduces the pension by 5 per cent for each year below age 62 for persons who are at least 55 years of age and have 30 years of service.

Actuarial reduction of pensions in case of early retirement is based on the following factors:

(i) longer life expectancy at younger ages;

(ii) loss of interest on payments made between the early retirement date and the normal retirement date.

The amount required to purchase an annuity at ages 55 to 65 inclusive is shown in Tables 3 and 4. Each table uses GAM 71 mortality (1971 Group Annuity Mortality table) but Table 3 uses 3-1/2 per cent interest while Table 4 uses 7 per cent interest. These tables indicate that an approximate reduction of 5 per cent per year is appropriate for lower interest rate assumptions, while 6 per cent reductions (or 1/2 per cent per month) are more appropriate for higher interest rate assumptions.

Table 3
Reduction Factors Based on 3-1/2 Per Cent Interest and GAM 71 Mortality

Male retirement age	Actuarial value of $1 annual pension	Amount of annual pension bought by $12.097	Actuarial reduction in pension compared to pension at 65	5 per cent reduction per year of early retirement
	(Dollars)	(Dollars)	(Per cent)	(Per cent)
65	12.097	1.000	0.0	0.0
64	13.152	.920	8.0	5.0
63	14.264	.848	15.2	10.0
62	15.433	.784	21.6	15.0
61	16.660	.726	27.4	20.0
60	17.948	.674	32.6	25.0
59	19.296	.627	37.3	30.0
58	20.708	.584	41.6	35.0
57	22.183	.545	45.5	40.0
56	23.724	.510	49.0	45.0
55	25.333	.478	52.2	50.0

Source Civil Service Commission.

Table 4
Reduction Factors Based on 7 Per Cent Interest and GAM 71 Mortality

Male retirement age	Actuarial value of $1 annual pension	Amount of annual pension bought by $9.630	Actuarial reduction in pension compared to pension at 65	6 per cent reduction per year of early retirement
	(Dollars)	(Dollars)	(Per cent)	(Per cent)
65	9.630	1.000	0.0	0.0
64	10.721	.898	10.2	6.0
63	11.909	.809	19.1	12.0
62	13.201	.729	27.1	18.0
61	14.603	.659	34.1	24.0
60	16.123	.597	40.3	30.0
59	17.770	.542	45.8	36.0
58	19.551	.493	50.7	42.0
57	21.476	.448	55.2	48.0
56	23.555	.409	59.1	54.0
55	25.799	.373	62.7	60.0

Source Civil Service Commission.

Submissions

Improved early retirement provisions were proposed by the OPPA, the ONA, the OTF, and the MEG. In support of its recommendation of an earlier retirement age for policemen, the OPPA referred to the stressful nature of police work and to the fact that the average OPP officer is expected to work at age 55 at the same speed and rate as a 25-year-old. It also noted the retirement age for police officers was lower than that for other public servants in nine major plans surveyed across Canada.

The OPPA recommended that:

(i) the current maximum pension should be available to police officers after 30 years of service, rather than 35;

(ii) the normal retirement age should be 25 years of service or age 55 + 10 years of service; and

(iii) the early retirement requirement should be 10 years of service, with a reduction of 5 per cent for each year retirement precedes age 55 or 25 years of service (whichever is less).

Although most policemen can retire on full pension at around age 55 to 57, not all take advantage of the opportunity. The OPPA suggested that some probably continue to work to stay ahead of inflation. In other cases, they stay in order to increase their pension entitlement. Perhaps more important was that, not being trained for other employment, they tend to stay in police work. Pre-retirement programs which are planned would help in this respect. In addition, retired employees cannot work for the government in any capacity without having their pensions reduced.

The OPPA representatives were questioned about the possibility of restructuring jobs so that people aged 55 could do work more suited to their physical capacities. The view of the association was that in these days of financial constraints that was not possible. Previously, older members were used in communications, but now civilians do the same work at lower pay.

The demanding nature of the work which their members perform was also referred to by the ONA and the OTF in support of recommendations for earlier retirement. The ONA noted that with the financial constraints on hospitals and the higher salaries of nurses today, hospitals hire fewer nurses and demand more work in return. There is no scope for transferring older employees to lighter duties, and it is not possible for nurses to work after age 60. While HOOPP has early retirement at age 62 and 20 years of service, these have to be continuous years of service, a requirement not all nurses can meet.

The OTF, observing that teaching was a demanding profession, recommended that the Teachers' Superannuation Act be amended to provide a 70 per cent pension on completion of 30 years of service. The current job situation was also a factor underlying this recommendation. The OTF was seriously considering job-sharing arrangements because of the current employment situation and had been counselling people to commit themselves to a certain retirement age. However, it would not want people's pensions to be adversely affected because they agreed to retire early or to share their jobs with someone.

The MEG recommended that there should be a "35 years of service and out" option in the Public Service Superannuation Act. While only a few people would benefit from this, it would be consistent with many private sector plans which have 35-and-out (and even 30-and-out) provisions. The impact on the fund would be minimal and it might be an effective long-service reward. The MEG also proposed that there be a "pay ahead" provision for earlier retirement under which long-term contributors would be allowed to resign on full pension if they paid, say, double contributions to retirement and accepted a deferred pension.

Requests for early retirement improvements are based on two factors:

(i) job stress and/or the physical demands of the job; and

(ii) the need to create more employment and promotional opportunities.

No evidence was provided, nor could any be obtained, to support contentions that employees in any occupation were "burned out" or unable to meet the demands of their job after a certain age (e.g., data on disability rates by occupation and age). This may also be viewed as a personnel problem. If job requirements cannot be met by some employees after they reach a certain age, perhaps more consideration should be given to the restructuring of jobs, including the creation of part-time jobs, to enable employees to work at a pace that is suited to their capacities. However, under final earnings plans, a switch to a lower-paying job during the later years of a person's working career could significantly reduce the pension received at retirement. If the move were to a part-time job, the employee generally would be no longer eligible for pension plan membership.

There is little doubt that improved early retirement provisions in the public sector would result in the creation of more jobs and promotional opportunities. Older employees are more heavily represented in senior positions. Lack of promotional opportunities, however, is not a problem unique to the public sector, but a general one which reflects recent demographic trends. The problem might be aggravated in the public sector by the fact that the vast majority of employees are covered

by final earnings plans which tend to discourage employees from moving to less senior positions.

Mandatory Retirement

Although this was not an issue raised by any other group, it was the major concern of the firefighters, whose comments centered on the application of age and discrimination rules in the Ontario Human Rights Code to their negotiated retirement at age 60 (58 of 70 locals have compulsory retirement provisions in their contracts).

The OPFA stated that firefighting is a very tough job, where the need is for a person who is totally physically fit and ready to do all kinds of strenuous work under dangerous conditions. Since most individuals cannot perform vigorously after 60, and as some cannot even go through a fire drill, all firefighters should be forcibly retired at age 60. Allowing people to continue beyond that age would present additional hazards to fellow workers.

The association noted that, in recognition of their job performance requirements, OMERS makes provision for firefighters to retire at age 60 without actuarial reduction. The OPFA also stated that members of the provincial government had indicated to them that the age discrimination rules were never intended to apply to firefighters.

CONTRIBUTIONS

The five major plans were and still are contributory, although the original Hydro legislation permitted it to be non-contributory. There is only one non-contributory plan in the public sector - for the hourly staff at McMaster University. In all others employees must contribute a certain percentage of earnings. Today this percentage is a fixed rate for all members; in the past some plans provided for increasing contributions according to age. Current contribution rates for employees are as follows:

PSSF, TSF: Employees contribute 6 per cent of earnings (including the CPP contribution)(10), and an additional 1 per cent for escalation of benefits under the Superannuation Adjustment Benefits Act, for a total of 7 per cent of earnings (e.g., for earnings of $20,000 in 1978, $1,230.80, excluding CPP contributions).

OMERS: Contribution rates vary according to normal retirement date. Normal retirement at age 60 is available to groups of policemen and firemen. For normal retirement at age 65, which applies to 86 per cent of members, the employee contributes 5-1/2 per cent of earnings to the YMPE level and 7 per cent above this level ($1,244 for earnings of $20,000 in 1978). For normal retirement

at age 60, the employee contributes 6-1/2 per cent to the YMPE level and 8 per cent above this level ($1,444 for earnings of $20,000 in 1978). OMERS members make the highest contributions in the public sector.

HOOPP: Employees contribute 4.5 per cent of earnings up to the YMPE level and 6 per cent above it ($1,044 for earnings of $20,000 in 1978).

Ontario Hydro: Employees contribute 3.43 per cent of earnings up to the YMPE level and 5 per cent above that level ($836.72 for earnings of $20,000 in 1978).

There are a few exceptions to the general approach to contributions. In a few university plans, the required contributions to the employer's plan on earnings above the YMPE are twice or more than those on earnings up to that level; e.g., University of Toronto - 2.5 per cent to YMPE, 5 per cent above; Trent University - 3 per cent to YMPE, 6 per cent above; and Algoma - 2 per cent to YMPE, 5 per cent above. In each case, the benefits provided by the plan are proportionate to the different rates of contribution. Another notable variation is the contribution rate for WCB employees hired prior to 1972. The latter contribute on the basis of a scale related to age, from 4.4 to 5.75 per cent.

Employer contributions are based on one of two approaches. Either the employer matches the contributions made by the employees and is responsible to make up any deficiencies if these funds are not enough to pay for the future pension, or the employer contributes the balance required to fund the plan. Employer contributions for the major plans in 1978 were as follows:

PSSF: The provincial government as employer matches the contributions of the employees.(11)

TSF: The provincial government matches the employee contributions plus interest at the rate of 6 per cent (compounded semi-annually) on January 1 of the following year.(12)

OMERS: The employers pay the balance required to fund the plan in accordance with the Pension Benefits Act.(13)

HOOPP: The hospitals as employers pay the balance required to fund the plan in accordance with the Pension Benefits Act.

Ontario Hydro: The employer contributes the difference between the amount of employee contributions and the cost of benefits as determined by actuarial valuations.(14)

VESTING, LOCKING-IN, AND PORTABILITY

Nearly all public sector pension plans have vesting provisions which are more favourable than the legal minimum of age 45 and 10 years' service. The PSSF, TSF, and HOOPP have a 10-year service requirement for vesting. Ontario Hydro has a one-year vesting provision and OMERS, University of Toronto, and Queen's University have immediate vesting.

The public sector plans provide for locking-in of employee contributions after age 45 and 10 years' service following the legal maximum, although it is legally permissible to provide for earlier locking-in if the plan provides for earlier vesting. (The PSSF could require locking-in of employee contributions after 10 years' service and Ontario Hydro could provide for locking-in after one year's service. The plans, however, generally give a choice to vested members so that they may leave their contributions in the fund if they wish).

An employee who is not vested will receive a refund of his or her own contributions upon termination. An employee who is vested but who is not age 45 with 10 years' service has a choice of receiving a refund of his or her own contributions or leaving the contributions in the pension fund and obtaining a pension at age 65 based on the employer's and employee's contributions. An employee who is vested and who has reached age 45 with 10 years' service has no choice and will receive a pension at age 65.

Most terminating employees who had a choice of a refund of their contributions or a deferred life annuity opted for the former. In 1976, 12.63 per cent of terminating employees in the PSSF chose to receive a deferred annuity. In OMERS, over the period 1974 to 1977, 18.95 per cent of the males and 15.06 per cent of the females who had 10 years' service and who were under age 45 elected a deferred annuity. In the TSF, by contrast, 86.9 per cent of terminating employees in 1977 who had 10 or more years of service elected a deferred life annuity.

Contributors who receive a refund of contributions are paid 5 per cent interest compounded annually in the PSSF, and OMERS; 3 per cent per annum compounded half-yearly in the TSF; 3 per cent compounded annually up to December 3, 1971 and 5 per cent compounded annually thereafter in HOOPP; and 3 per cent compounded annually up to December 31, 1960 and 4-1/2 per cent compounded annually in Ontario Hydro.

Portability

Portability exists generally within the public sector itself, that is, vesting of pension rights and obtaining a pension is not completely dependent on continuous service with the same employer, as is usual in the private sector. Among the five major plans, members may count as pensionable service any service which is transferred from another public sector plan under a reciprocal agreement. Amounts of contributions are

transferred from the old plan to the new plan, and any shortfall may be made up by the transferring employee. Reciprocal transfer agreements present certain difficulties in achieving full portability, as discussed in Chapter 6.

While an employee who terminates without vesting receives only a refund of his or her own contributions, with interest, an employee who transfers to another plan under a reciprocal agreement receives credit for double contributions plus a nominal rate of interest (varying from 3 to 5 per cent) for years of service with the previous employer. If the amount transferred is less than the receiving plan requires, the employee has the option of purchasing up to the full pension service credit earned in the exporting plan. Most university plans also allow for the transfer of double contributions plus the fund rate of interest either to another employer's plan or to an RRSP, provided the contributions are locked in. Up to about age 45, double contributions would provide for higher benefits than those promised in any defined benefit plan for each year of service, while for older employees they fall increasingly short of purchasing the promised benefits.

Where employees have had to terminate their membership in a pension plan as a result of the transfer of programs from one area to another of the public sector, a variety of bases has been used in calculating pension transfer values. In each case, apparently, the transfers have resulted in problems, primarily because of the different levels of benefit provided by various plans. Employees transferred into the PSSF generally come from plans with lower benefits and lower contributions. Where the funds transferred did not purchase service credit in the PSSF equal to the years accumulated in the previous pension plan, employees were required either to accept a shorter service credit or pay the difference between the amounts transferred and the amounts assessed by the PSSF. In many cases these payments amounted to several thousand dollars. Where the funds were transferred on the present value basis, the younger employees found that frequently only their own contributions were transferred. Where double contributions were transferred, employees also had to make up the difference. The only exception was the Ontario Housing Corporation group, for whom the funds transferred to the PSSF were sufficient. All other transfers were made on a present value basis; none, it appears, has proved wholly satisfactory.

Another measure of portability is achieved because members in the public sector do not have to be employed continuously, so that previous service with the same employer may be included for determining pension entitlement. Teachers have the most generous provision in this respect because, upon re-employment, a contributor may reinstate his or her previous account at no cost if the employee had not withdrawn past contributions. In the PSSF, the contributor pays an assessment based on salary at the time of re-employment. In Ontario Hydro, an employee may reinstate pension credits if re-employed within one year, by repaying

contributions withdrawn plus interest. Neither OMERS nor HOOPP has any provision for reinstatement of past service.

In the PSSF and OMERS, there are provisions for members to establish credit for previous non-pensionable service. In the PSSF, employees may do this by paying an amount based on salary during the period in which they were not contributors. In OMERS, the employer may pay for the full cost of such service, subject to negotiation with employee groups. In the PSSF and TSF, members may make contributions for wartime service. All major plans except HOOPP permit employees to contribute for periods of authorized absences. The latter provision appears to be particularly advantageous to members of the TSF, since they may take leave of absence for a period of up to two years for travel or study purposes, and may continue their membership in the plan while members of the Legislative Assembly.

Reciprocal transfer arrangements between the public and private sectors are rare. While it seems to have been possible in the public sector to devise transfer provisions that accommodate considerable differences in benefit levels and their valuation, similar compromises among plans in the private sector or between private and public sector plans would require a common approach to pension costing. It would also require some consensus on the desirability of facilitating employee mobility. Reciprocity in the public sector plans reflects a measure of common purpose among the sponsors of plans which, directly or indirectly, are a responsibility of the provincial government. The same basis for reciprocal agreement is not perceived, as a rule, by private plan sponsors.

Desired Changes

Improved portability of pensions was recommended by many groups and individuals. Most saw improved vesting provisions as the basic means by which this should be achieved.

OCUFA ranked portability as its first major concern, a problem related to the variety of university plans as well as restrictive vesting provisions. A number of other groups, notably CUPE, OPSEU, the ONA, and the OTA made detailed comments on this subject in their submissions to the Commission. Briefly their recommendations were as follows:

- CUPE: Minimum standard of full vesting after 5 years of service or at age 30, with locking-in. Creation of a central pension agency to record, transfer, and pay pension benefit credits.

- OPSEU: Vesting after 5 years of service. Locking-in only if deferred benefits are indexed.

- ONA: Immediate vesting and portability.

- OTF: Accrued pension benefits to be vested immediately on employment, and Section 16 of the Ontario Pension Benefits Act to be implemented in order to create a holding bank. Locking-in of employee contributions at age 40.

The OTF noted that, to all intents and purposes, it already had portability and vesting by way of linked service and reciprocal agreements. The ONA, in support of its recommendation for immediate vesting and portability, noted that while there is portability within HOOPP, there is no portability for employees of independent hospital plans. More fundamentally, while many nurses put in long years of service, few have the unbroken service that is required to build up pension rights under current vesting regulations.

The OPPA did not see portability as a major problem, since there is little mobility in the police force. After 5 years, policemen tend to stay in the force. The MEG listed poor portability as one of the weaknesses of the PSSF, especially if an employee wishes to move to the private sector. It suggested that a centralized agency might be established with which all participating organizations would have to deposit their contributions.

DISCLOSURE

Most of the employee groups with whom Dr. Kelly met were highly critical of the information provided to them about their pension plans. Only the OTF was satisfied with the approach taken to information disclosure. It considered the teachers' plan a model in this regard, and expressed the hope that other pension plans would do the same for their members.

CUPE and the ONA both made reference to the difficulties they had encountered in obtaining information about HOOPP. The ONA commented that nurses are poorly informed about their pension benefits, and it was very difficult to obtain any information. Personnel departments of the hospitals know very little and get little help from the OHA in describing the plan to members. Lines of communication between the union and the OHA are very poor. The ONA frequently hears of changes by way of inquiries from individual members. Changes in HOOPP and its benefits are made unilaterally by the OHA, and members may or may not be informed. CUPE was equally critical, describing the OHA as the most difficult group it had encountered as far as withholding of information is concerned.

OPSEU stated that it was seeking legislation to provide for the reasonable disclosure of certain information about pension plans. For example, it wanted information from the Public Service Superannuation Board about its retired members, but had been unsuccessful in obtaining this information.

University plans were also subject to criticism in this respect. OCUFA maintained that university employees receive very poor information about their pension. They feel entitled to all information regarding their pensions as it is part of their compensation. When they do not receive information about it, they suspect that something is wrong with the plan. The University of Guelph Staff Association stated that poor disclosure had made the university plan very unpopular with the staff, many of whom do not think their plan is as good as the university makes it out to be, and many of whom want their money out. The association added that before unions at the university could bargain on pensions they needed to have a much better understanding of the investment and income of their plan. At present, the only information being disclosed is an annual report to all employees giving them some idea of their eventual benefits, but nothing more.

Representatives of the York University Faculty Association remarked that very little information was communicated to the faculty about the pension plan, but employees were partly responsible in that they showed little concern about getting more information. Most information, such as actuarial reports and the composition of fund assets, was available on request. The delegates felt that the personalized annual statements which they received about their pensions were useful and that the staff administering the plan were very helpful. The plan text is currently being rewritten to clarify its provisions and remove ambiguities.

Although employee and pensioner groups were generally critical of the amount of information they received about their pension plans, most plan sponsors maintained that they provided a great deal of information to plan members. Most reported that they provide personalized annual statements, pension plan brochures, annual reports, and pension information at members' retirement. Many also provide pre-retirement counselling. The only kind of information that employers said was not provided to plan members was personal information about other members.

Despite this, it is obvious that pension plan members do not feel that they have adequate information about their pension plans, one of the major gaps being the limited information they receive about financial aspects of the plans to which they contribute. A more specific aspect of disclosure was mentioned by the Ontario Municipal Retirees Organization, stating that it was unable to obtain information from OMERS regarding the names and addresses of retirees. OMERS, however, did mail to pensioners information prepared by OMRO. More generally, OMRO was critical of the lack of information provided to pensioners about the OMERS plan.

COMPARISONS WITH OTHER JURISDICTIONS

This section presents a brief comparison of the main provisions of both the PSSF and the Legislative Assembly Retirement Allowances Plan with similar plans in other jurisdictions in Canada.

Government Employee Plans

Pension Formula

The retirement benefits provided by the PSSF - 2 per cent of best 5 years' average salary per year of service less .7 per cent of earnings up to the YMPE (averaged over the last three years) for service from 1966 - are much the same as those provided in other jurisdictions. Differences result mainly from variations in the CPP offset and in the final earnings base. The PSSF provides a somewhat higher basic benefit than the federal and Manitoba government plans, which use best 6 and best 7 years' salary respectively as the earnings base, though Manitoba has a lower CPP offset. It provides a somewhat lower benefit than Quebec, Alberta, and Prince Edward Island. Quebec and Alberta both use a five-year average of YMPE in determining the CPP reduction, and Alberta also has a smaller offset - .6 per cent - than the PSSF. The Prince Edward Island plan differs from the PSSF in that pensions are based on the best 3 years' salary, rather than the best 5. In Nova Scotia and Newfoundland, the pension formulas are more complex than those in other plans, but they would appear to generate benefits much the same as those in the PSSF. In New Brunswick and Saskatchewan the pension formula is identical to that of the PSSF. (The recently introduced money-purchase plan in Saskatchewan, applicable to employees hired after October 1977, is not directly comparable with the PSSF or with public sector plans in other jurisdictions.)

Contributions

Employee contributions to the PSSF, which amount to 7 per cent of salary including CPP and escalation contributions, are higher than those in public sector plans in most other jurisdictions, (all of which, except for the new Saskatchewan plan, are integrated with the CPP). Alberta has the lowest contribution rate - 5 per cent of salary - followed by Newfoundland at 6 per cent. Contributions in Prince Edward Island, Nova Scotia, and British Columbia are about 6.5 per cent of salary (including contributions for indexing in British Columbia). In New Brunswick and Manitoba the contribution rate is marginally less than 7 per cent. The new Saskatchewan plan, which has a contribution rate of 5 per cent plus CPP, results in contributions of about 6-1/2 per cent up to the YMPE and progressively lower rates above that level.

Employee contributions to the PSSF are lower than those in Quebec (7.5 per cent), the federal government (7.5 per cent including indexing), and in the Saskatchewan closed plan. The latter is unique among government employee plans in grading contribution rates according to the employee's age on entering the plan, the rates ranging from 7 to 9 per cent.

As in the PSSF, employee contributions are matched by the employer in the Federal Superannuation Plan and also in British Columbia, New

Brunswick, Nova Scotia, and in the new Saskatchewan plan. The federal and Ontario governments also meet deficiencies that may arise. In other jurisdictions, and in the closed Saskatchewan plan, there is no specific employer contribution, payments either being made as necessary or according to a formula in which the employer meets a specified proportion of the annual benefits.

Escalation

In most jurisdictions there is provision, as in the PSSF, for automatic increases in pensions based on changes in the Consumer Price Index, generally subject to a ceiling. The exceptions are Alberta, which in fact has made annual increases based on the CPI but has no provision for automatic adjustment; Newfoundland, which has followed the same practice and policy as Alberta; and Saskatchewan, where there is provision in the legislation for ad hoc increases. In the other jurisdictions adjustments are made annually except for British Columbia, which makes regular quarterly increases.

In most jurisdictions that have formal provision for cost-of-living increases, adjustments are subject to an annual ceiling ranging from 4 to 8 per cent. In Manitoba, the increase is limited so that employee contributions allocated to the account in the prior year are able to finance half of the increase. Only the federal government, British Columbia, and Ontario follow the practice of requiring additional employee contributions for escalation benefits to be accounted for in funds separate from the main plans.

Retirement Conditions

In Quebec, Saskatchewan, Alberta, and New Brunswick, the normal retirement age is 65, as in the PSSF. Quebec and Saskatchewan require employees to have 10 years of pensionable service in order to be eligible for a pension - as does the PSSF - whereas in the other two provinces the minimum service requirement is five years. Other jurisdictions in Canada have a normal retirement age of 60, with a 10-year minimum service requirement except in the federal government, where employees can qualify with five years' pensionable service.

In the PSSF, and in Quebec, Saskatchewan, and New Brunswick, employees may retire on full accrued pension at age 60 if they meet specified service requirements - 20 years in Ontario and Saskatchewan; 30 years in the other two provinces. The new Saskatchewan plan has an additional option of retirement at age 55 with 30 years of service. Employees may also retire at age 55 in the federal government and in British Columbia, subject to service requirements of 30 and 35 years respectively. Ontario and Alberta are the only jurisdictions which allow early retirement based on a combination of age and service - 90 points in Ontario; 85 points in Alberta.

Survivor Benefits

The PSSF and six other jurisdictions have a 10-year eligibility requirement for survivor benefits. In the federal government, and in New Brunswick and Alberta, the service requirement is five years. In Quebec a survivor pension is paid only if the contributor's combined age and service was at least 90 years or if he or she was receiving a pension.

Saskatchewan's closed plan is the only one that has a provision identical to that in Ontario - 50 per cent of accrued pension after 10 years of service. New Brunswick provides a 50 per cent pension after 5 years of service and Quebec provides a similar pension under the more restrictive terms noted above. In Newfoundland, the survivor benefit is 55 per cent of the accrued pension; in Manitoba it is 60 per cent; and in Nova Scotia and Prince Edward Island it is 50 per cent plus 10 per cent for each child to a maximum of four, in all cases after 10 years of service. In the federal government, the survivor pension is the same as in Nova Scotia and Prince Edward Island, but with a five-year eligibility condition. Alberta and British Columbia both have Joint Life and Last Survivor Plans, the eligibility period being 5 and 10 years respectively. Saskatchewan's new money-purchase plan provides for a lump-sum payment or an annuity based on accumulated employer-employee contributions.

In the case of the death of a contributor prior to becoming eligible for survivor benefits, most public sector plans provide for a refund of the employee's contributions with interest. In Ontario and Alberta, a surviving spouse gets a return of double contributions with interest.

Equalization within Jurisdictions

There appears to be somewhat greater uniformity of benefits within the public sector in most other jurisdictions than in Ontario. While no jurisdiction has one plan covering all public sector employees, the federal government and Quebec government plans have a much wider range of membership than the PSSF does, while in some other jurisdictions there appears to be a high degree of uniformity of benefits among different plans. It appears too that efforts are being made in some provinces to bring about greater equalization of benefits.

NOTES

(1) Statutes of Canada 1870, 33 Victoria, CAP IV.

(2) See "Legislative History of Major Ontario Public Sector Pension Plans." The precursor of today's Teachers' Superannuation Act was introduced in 1917.

(3) The Ontario Public Service Superannuation Act, S.O. 1920, 10-11 George V, c. 4.

(4) An Act to amend The Power Commission Act, S.O. 1919, 9 George V, c. 16. However the plan did not begin until 1923.

(5) The plan was established by the Ontario Hospital Association and is not regulated by specific legislation.

(6) An Act to establish the Ontario Municipal Employees Retirement System, S.O. 1961-62, c. 97.

(7) Statistics Canada, Labour Force Annual Averages, 1975-78, Cat. 71-529, Table 3, p. 19; Ontario Public Sector Pension Plan Data.

(8) Forty per cent of the Year's Maximum Pensionable Earnings under the Canada Pension Plan.

(9) For example, Queen's University as described in Brief 227.

(10) The precise contribution is 6 per cent of earnings to the level of earnings exempt from CPP, ($1,040 in 1978), 4.2 per cent of earnings between the YBE and the Year's Maximum Pensionable Earnings (1.8 per cent being the CPP contribution), and 6 per cent above YMPE. ($10,400 in 1978). The 1978 CPP employee contribution was $169.20.

(11) The Public Service Superannuation Act RSO 1970, c. 387 as amended provides in Section 10(1) as follows:

> Except as otherwise provided, where a contribution is credited to the fund an equivalent amount shall be credited to the fund out of the monies appropriated therefore by the legislature.

(12) The Teachers' Superannuation Act RSO 1970, c. 455 as amended provides in Section 22(1) as follows:

> Annually and at the same time as the total legislative grant is payable to the board or other authority, the Treasurer shall place to the credit of the fund a sum equal to the contributions made by or on behalf of the persons to whom this act or the regulations apply.

(13) The Ontario Municipal Employees Retirement System Act RSO 1970, c. 324 as amended provides in Section 10 as follows:

> The contributions of the employers who participate in the system shall be such an amount as is required, in addition to the contributions of the members and the interest earned by

the fund, to provide for the payment of the benefits and the expenses under the regulations.

(14) The Power Commission Act RSO 1970, c. 354 as amended provides in Section 21(4) as follows:

> The Commission shall contribute toward the cost of the benefits mentioned in sub-section 1 the amount of the difference between the amount of the contributions of the employees and the amount of the cost of the benefits as determined by actuarial valuations.

LIST OF TABLES

Table 1 - Ontario Public Sector Percentage Increases in Post-Retirement Pensions, by Sub-sector and Percentage Range, 1971-78 34
Table 2 - Ontario Public Sector Post-Retirement Pension Increases, by Sub-sector, Cumulative Increase and Type of Increase, 1971-78 35
Table 3 - Reduction Factors Based on 3-1/2 Per Cent Interest and GAM 71 Mortality 48
Table 4 - Reduction Factors Based on 7 Per Cent Interest and GAM 71 Mortality 49

Chapter 3

Funding of Public Sector Plans

INTRODUCTION

The recent experience of public sector pension plans in New York City in which the plans seemed on the brink of bankruptcy has brought many people in Ontario to question the financial position of Ontario's public sector plans. The conversion of public sector plans in Saskatchewan from defined benefit to defined contribution plans has raised further questions. Part of the Commission's terms of reference calls for an assessment of the effectiveness of Ontario's plans for its employees, which in turn requires an examination of their funding status and the cost of fulfilling the funding requirements. The cost element is examined in the Chapter 5.

In 1965, when the Pension Benefits Act was introduced, the Government of Ontario adopted the policy of having pension plans for all public sector employees come under the jurisdiction of the Pension Benefits Act. Accordingly, all plans are required to comply with the funding and solvency provisions of the act and regulations. The Legislative Assembly Retirement Allowances Account (LARA) for former members of the Legislature does not come under the Pension Benefits Act at the present time since those covered are not employees of the government.

Since the Public Service Superannuation Fund was established in 1920 and the Teachers' Superannuation Fund in 1917, various funding procedures had been adopted over the years, and by 1965 substantial unfunded actuarial liabilities had accumulated. In 1965 rather than call for liquidation of these amounts over a set period of years it was settled that interest only would be paid on these liabilities in perpetuity. It could reasonably be expected that as pension obligations grew these liabilities would form an increasingly smaller part of pension liabilities. Furthermore, the taxing power of the government was

always available to make good on these liabilities should the need ever arise.

R.R.O. 1970, Reg. 654, s. 2(13) under the Pension Benefits Act provides:

> "Where a pension plan is administered for the employees of a government, the special payments in respect of an initial unfunded liability existing on the 1st day of January, 1965 may be limited to the annual amount required to prevent any increase in such liability."

Use of this section has been limited to the PSSF and the TSF. Except for this departure from the usual funding provisions, public sector plans have been administered in accordance with the Pension Benefits Act.

In recent years many have become alarmed by large and unexpected increases in unfunded actuarial liabilities revealed in actuarial evaluation for periods ending in 1974 and later, both in the private and the public sector. The Commission has given particular attention to the meaning of those unfunded actuarial liabilities in the Ontario public sector. The subject of funding as it applies to pension plans in general is dealt with at length in Volume II, Chapter 9. The reader is referred to this for an understanding of the terms used in the discussion which follows.

FUNDED STATUS OF SIX MAJOR PLANS

The Commission asked Keith Cooper, one of its consulting actuaries, to assess the actuarial status of six major plans in the Ontario public sector:

Public Service Superannuation Fund (PSSF)
Teachers' Superanuuation Fund (TSF)
Ontario Municipal Employees Retirement System (OMERS)
Hospitals of Ontario Pension Plan (HOOPP)
Ontario Hydro Employees' Pension Plan (Hydro)
Ontario Workmen's Compensation Board Superannuation Plan (WCB)

These six plans cover 84.5 per cent of public sector employees in Ontario and control nearly nine billion dollars of assets - the major portion of assets of all public sector plans.

Mr. Cooper's findings appear in full in Volume VII of the report. Table 1 prepared from Appendix A of his report shows the funded status of each of the plans at the date of the latest triennial valuation available in 1978. It should be noted that Mr. Cooper's assessment in Column 4 shows the relationship of plan assets to actuarial liabilities

on a test valuation or approximate wind-up value basis at the date of valuation. For example, if the PSSF were wound up at December 31, 1976, the assets would be sufficient to pay $.86 on every dollar of liability for pension benefits to December 31, 1976. This ignores certain priorities on wind-up required under the Pension Benefits Act; the actual percentage in practice would not be 86 per cent of benefits for all employees. Some would receive 100 per cent of entitlement and others less than 86 per cent. The ratio also does not tell us whether the unfunded portion arises from experience deficiencies or the additional cost of such features as early retirement. However, the funded ratio approach does indicate that the pension plans are in good financial shape and that fears such as those over some U.S. public sector plans are not warranted for Ontario public sector plans.

Table 1
Funding Status of Six Major Public Sector Employment Pension Plans in Ontario

	Actuarial valuation date	Actuarial valuation method	Ongoing basis: Unfunded actuarial liability or (surplus) (Thousands of dollars)	Ongoing basis: Per cent total liabilities (Per cent)	Wind-up basis(a): Unfunded actuarial liability or (surplus) (Thousands of dollars)	Wind-up basis(a): Funded ratio (Per cent)
Public Service Superannuation Fund (PSSF)	Dec. 31, 1976	Level premium entry age normal	505,355	19.3	214,426	86
Teachers' Superannuation Fund (TSF)	Dec. 31, 1975	Level premium entry age normal	1,397,178	20.6	375,190	85
Ontario Municipal Employees' Retirement System (OMERS)	Jan. 1, 1977	Accrued benefit unprojected(b)	(110,632)	14.6	Not available	Estimated over 100
Hospitals of Ontario Pension Plan (HOOPP)	Dec. 31, 1976	Accrued benefit projected	122,133	20.6	Not available	Estimated over 100
Ontario Hydro Employees' Pension Plan (HYDRO)	Dec. 31, 1976	Accrued benefit projected	142,530	15.9	Not available	Probably about 100
Ontario Workmen's Compensation Board Superannuation Plan (WCB)	Dec. 31, 1977	Level premium entry age normal	(13,024)	(13.2)	(18,740)	134

a Accrued benefit method without projections for salaries or allowances for future turnover.
b OMERS uses accrued benefit projected method for final average plan from Janaury 1, 1978.

Source Royal Commission on the Status of Pensions in Ontario, Keith Cooper, Appendix A, "Report on Public Sector Pension Plans."

Plans like OMERS and WCB which show surpluses are "fully funded" according to the Pension Benefits Act. Plans like the other four, which have large unfunded actuarial liabilities but for which provision has been made for their orderly liquidations over time, are "provisionally funded" according to the Pension Benefits Act. By falling into either of these two classifications, all six plans are deemed under the act to be solvent. All plans show smaller liabilities on a wind-up basis than on an ongoing basis because there are no salary projections such as those required for valuation on an ongoing basis.

With regard to the PSSF and TSF plans, their post-retirement adjustment funds (PSSAF and TSAF) are excluded and accounted for separately. There were large unfunded actuarial liabilities in both of these funds as at December 31, 1976.

DESIRABILITY OF FUNDING

Mr. Cooper in his report notes:

> "The funding of public sector pension plans (PSPP's) is a controversial subject. At one extreme, we find those who advocate pay-go funding in recognition of the fact that the government entity has an ongoing tax base from which to generate the necessary revenues to support the obligations of the pensions promised. Consequently, they question why huge reserves need to be established to cover these future promises when such assets could be put to better use today. Furthermore, they question why today's more valuable or 'hard' dollars should be tied up when future payments can be made with cheaper or 'soft' dollars.
>
> "Those who advocate the funding of PSPP's, on the other hand, are concerned about the future ability of the governmental entity, regardless of its size, to meet pension obligations unless a disciplined approach to prefunding has been undertaken. They see the desirability in charging current generations for their fair share of the cost of pension promises made to current members of the governmental unit. Good accounting practices are foremost in their mind as is the desirability of assuring the plan members of the security of their pension promises. Real assets also represent a base to fall back on should the governmental entity run into cash flow difficulties. The recent experience in New York City and the current Cleveland financial crisis are certainly supportive of the need for real assets versus using public debt."

The Commission accepts the fact that a pay-go approach could be considered for all public sector plans if security of the promise were the only point at issue. It is firmly convinced, however, that funding is essential for cost control. It therefore recommends that:

The Government of Ontario continue to support the principle that all public sector employment pension plans, being those directly or indirectly funded by government obligations or guarantees, come within the provisions of the Pension Benefits Act, and that, except as recommended for the Legislative Assembly Retirement Allowances Account, no new exceptions be made to permit continuance of an initial unfunded liability without provision for special payments to reduce such liability.

The Pension Benefits Act be amended to apply immediately to the Legislative Assembly Retirement Allowances Account in the same fashion as it now applies to public sector employees' plans, with any unfunded actuarial liability in the account at the effective date of such amendment to be treated as an initial unfunded liability on which interest only is payable under Section 1(13) of the regulations under the Pension Benefits Act, subject to the making of payments which may be necessary from year to year to fulfil cash flow requirements.

Any act creating a public sector pension plan whose provisions are not in accordance with the Pension Benefits Act be amended immediately to comply with the requirements of the Pension Benefits Act and to be subject to the requirements of the Pension Benefits Act.

FUNDING METHODS

From Table 1 we see that three plans, PSSF, TSF, and WCB, use a level premium entry age normal method of funding. HOOPP and Hydro use the accrued benefit projected method and OMERS the accrued benefit unprojected method. (OMERS changed to the accrued benefit projected method but with a minimum total contribution when it adopted a final average plan as of January 1, 1978.) The question then arises why the same method is not used for all plans and if it should be, which method should be used.

Mr. Cooper in his report notes that the level premium method always requires more fund assets to be on hand at a given time than does the accrued benefit projected method and therefore can be said to produce greater funding than necessary for public sector plans. He says the same conclusion could be drawn even where the accrued benefit projected method is used; therefore for the major public sector pension plans it may be sufficient if funding covers only the actuarial liability on a wind-up basis at a particular time. At some stage in the funding progression of every one of the plans this would require even smaller annual contributions than the accrued benefit projected method. There are however good reasons, which the Commission believes are relevant to the public sector, for requiring more than that minimal degree of funding. The chief reason is that level premium funding will maintain a

stable cost pattern for current service cost regardless of changes in the demographic structure of the plan membership. This is of particular importance now with the effect of declining school enrolment on the numbers and age distribution of members in the TSF. Whether other public sector plans may experience similar changes in the future is touched on in Chapter 5.

Where under the method chosen there is over-funding, consideration should be given to altering the payment arrangements until funding is reduced to a fully funded basis. The WCB at December 31, 1977 was 134 per cent funded on a wind-up basis and in a surplus position of $13 million or 13.2 per cent of total liabilities on an ongoing basis. Ordinarily this comment would apply as well to the OMERS plan, which at January 1, 1977 was estimated to be over 100 per cent funded on a wind-up basis and in a surplus position of $110.6 million or 14.6 per cent of total liabilities on an ongoing basis. We understand, however, that its position has already changed because of improvements in the plan formula which have absorbed much of the surplus.

Over-funding in general is unnecessary from the point of view of both the pension plan and the taxpayer, and should not be permitted to continue. The type of review suggested later, in the Commission's recommendations on cost, is designed to identify such situations so that steps may be made to rectify them. To build up surplus in the hope of achieving improved benefits more easily is not a proper goal of the funding techniques, if this has been the past approach in any of the plans.

The Commission believes that both the level premium methods and the accrued benefit methods for funding (within the five methods recommended for funding generally) should be employed for public sector plans, as the actuary for the plan may determine suitable, in accordance with guidelines set (as recommended) by the Pension Commission of Ontario. Suitability of a method should be gauged with the emphasis first on cost control and only secondly for security.

MATCHING CONTRIBUTIONS

The idea of a "matching contribution," i.e., an employer's contribution equal to that of the employee, is a common expectation in the public sector. It is specifically legislated in the Teachers' Superannuation Act, Section 22(1) which provides:

> "Annually...the Treasurer shall place to the credit of the Fund (TSF) a sum equal to the contributions made by or on behalf of the persons to whom this Act or the regulations apply."

At present teachers are required to contribute to the TSF 6 per cent of salary, including CPP contributions, and the province pays

a like amount, making a total payment of 12 per cent of payroll for current service cost.

The Teachers' Superannuation Act provides for the make-up of any deficits in the following terms:

> Section 3 "When the payments into the Fund in any year are insufficient to make the required payments out of the Fund, the deficiency shall be made up out of the Consolidated Revenue Fund."

In the latter section it is acknowledged, in effect, that a matching contribution arrangement may not be adequate for a defined benefit plan. Where a plan design involves both a specific benefit formula and a specific formula for employee contributions, the employer's contribution should not be fixed as well. Depending on age distribution, investment earnings and other factors, the employer's share of the cost may be more or less than the employees' - rarely is it the same, and then only by coincidence and temporarily. Since a "matching" contribution may not prove adequate to meet all benefit obligations, some additional provision is necessary in order to guarantee payment of the promised pensions. With the government as guarantor, the TSF is able to assure its members: (a) that the "employer" contribution is at least as much as their own; and (b) that any shortfall in the 50-50 funding will be made up, although on a year-by-year benefits payment basis only. (Theoretically, matching contributions in a defined benefit plan could generate an unjustifiably large surplus; but no surplus could long survive the pressure to raise benefit levels).

Clearly, the Teachers' Superannuation Act itself does not contemplate full prefunding of benefits, although the prescribed financing could - for a time at least - cover funding as required under the Pension Benefits Act. However, the government guarantee is expressed solely in terms of current contributions and benefit payments, and not in terms of payments toward existing and accruing liabilities. Accordingly, where there is a deficiency as that term is used in Section 3, and the government makes up the difference in that year, no additional government monies are available to make up any remaining deficiency arising from unfunded actuarial liabilities or (as may occur) from current service cost. In short, while the government guarantees the promised benefits, it does not ensure that the TSF will remain solvent and so continue to qualify for registration under the Pension Benefits Act.

At the time of its inception in 1917 and until the advent of pension benefits legislation in 1965, the teachers' plan was free to operate without an explicit provision for advance funding. Plan members are assured that the government will meet any future shortfall on a pay-as-you-go basis. From 1965, however, the administrators have had an obligation beyond the terms of the Teachers' Superannuation Act to

demonstrate that the plan's revenues are sufficient to meet its current service cost (for accruing benefits) and also to amortize through special payments any initial unfunded liability or experience deficiency.

Until the early 1970s it may be that the matching contributions in fact were sufficient to cover both current service costs and the equivalent of any required special payments. Thus, despite the quite different funding basis contemplated in the TSA, compliance with the solvency standards established by the Pension Benefits Act was at least possible. Reconciliation of the two appears to have become more difficult, however, with the rapid escalation of salaries in the mid-1970s and the consequent creation of new and substantial unfunded liabilities.

The actuarial report for the TSF for the three-year period ending December 31, 1978 sets out the problem created by the matching contribution principle:

"Current Service Contributions

Teachers now contribute to the Superannuation Fund 6% of their salaries, less their required CPP contributions. The Province matches these contributions and also makes the payments required to finance the unfunded liability in accordance with the Pension Benefits Act.

We found that the combined teacher-Province statutory contribution rate (12% less CPP) is now less than the minimum required contribution rate determined according to the actuarial cost method used in all valuations of the Teachers' Superannuation Fund. If the matching principle is to be maintained, then both the teachers' contribution rate and that of the Province should be increased by 0.4% to 6.4% less CPP. If the teachers' contribution rate is not changed, then the Province's contribution rate should be increased by 0.8% to 6.8% less CPP.

"Minimum Annual Payments

In accordance with the Ontario Pension Benefits Act, the unfunded liability of $1,096 million should be financed by annual payments starting December 31, 1979 in the amount of $119,827,000. This annual payment continues in effect until December 31, 1989 and then reduces in accordance with the table given in our report.

The total annual payment of $119,827,000 is equal to about $1,056 per active teacher or 5.1% of the annual salary of active teachers on the valuation date. The annual amortization payment required in the years 1976 to 1978 inclusive was $144,436,000."

Thus it is clear that not only are special payments required of 5.1 per cent of payroll for which there is no legislative authority, but

also the present matching contributions of 6 per cent are insufficient to meet the current service cost.

There are at least three possibilities for correcting this situation:

1. The fund is now using an entry age normal (level premium) method which requires heavier funding than an accrued benefit method. Changing to the latter method would reduce current service cost. However as noted above the entry age method provides a stable cost which will become increasingly important as the age composition of the TSF membership changes with changes in the employment structure. The Commission would not recommend any change in the funding method.

2. The matching contribution could be increased to cover current service cost. Since the amount of contribution is fixed by statute this would require legislation, possibly every three years. The whole question of the contribution structure and a possible reduction of the benefit level to meet the contributions would be the subject of negotiation with the teachers. The Commission would not consider this a preferred answer, since it does not go to the root of the problem.

3. The matching contribution principle could be abolished and the government as employer would assume the same responsibilities as an employer in the private sector and be responsible for any cost, whether for current service or special payments beyond that covered by the employees' contributions and the return on investments. This should have a salutary effect toward attaching full cost to the benefits being provided. If matching contributions are to be maintained, then it becomes essential - as in any other plan - that benefit levels be adjusted from time to time to reflect what the contributions will purchase. It is also necessary to give careful consideration to investment policy in order to attain the best possible yield.

Similar problems are found in other public sector plans. The matching contribution principle occurs in the PSSF by Section 10 of the Act and in the case of OMERS by practice rather than by legal requirement. Under OMERS the board fixes the contribution rate for employees from time to time based on the amount recommended by the actuary to cover current service cost and special payments. The OMERS Brief(123) states: "In practice, so far employee and employer contribution share has been equal."

Mr. Cooper in his report comments unfavourably on the matching contribution principle:

"...if the actuarial assumptions are to be realistic, it is imperative that the actuaries' inclination to use current and realistic assumptions not be inhibited by a constraint to equate employee and employer current service costs."

Possibly the most unfortunate use of the matching contribution principle is that under the Superannuation Adjustment Benefits Act, 1975 (SABA). This act created the Superannuation Adjustment Fund Account for the purpose of paying the indexed portion of pension benefits for public sector plans designated under the act. To date four plans have been designated: TSF, PSSF, Ryerson Polytechnical Institute, and the Caucus Employees Retirement Plan.

Section 8a) of SABA requires employees to contribute 1 per cent of salary to the Adjustment Fund, and: "the employer shall contribute to the Adjustment Fund an amount equal to the amount contributed under clause a)." The act provides for review of the contribution rates of both employers and employees, but provides that the 1 per cent/1 per cent contribution shall remain unchanged until at least January 1, 1981. There is no provision in the act for the payment of current deficiencies out of Consolidated Revenue as we find in the TSF and the PSSF.

The actuarial valuation of the TSF as at December 31, 1978 reveals that already there are unfunded liabilities in this fund as it applies to teachers. The report states:

"Escalation

In 1975, the automatic escalation of teachers' pensions in accordance with changes in the Consumer Price Index was introduced. However, this change was made by enacting a new law, the Superannuation Adjustment Benefits Act. Special contributions, which are currently at the rate of 1% of salary, are paid by all teachers into a separate fund, the Superannuation Adjustment Benefits Fund. The Province's matching 1% contribution is also paid into the S.A.B. Fund and escalation benefits are paid from that Fund. As a result, the escalation benefits and the contributions earmarked for those benefits were not taken into account in our valuation of the Superannuation Fund.

If the escalation benefits were provided by the Superannuation Fund and financed in the same manner as all other benefits of that Fund, then the required contributions and the unfunded liability would be substantially higher than the results given in this report."

The Commission has commented elsewhere (see Volume II, Chapter 9 and later in this chapter) on the fact that the scheme of SABA offends the funding principles of the Pension Benefits Act and that it should be abolished. It is mentioned here as an example of the inappropriateness of a fixed matching contribution principle.

The Commission therefore recommends that:

The principle of "matching contributions" in all public sector plans providing defined benefits be abandoned, and that legislation and established policies setting contributions on a matching basis in such plans be amended so that contribution rates reflect the true cost responsibilities under the plan.

LEGISLATIVE AMENDMENTS REQUIRED

It should be noted here that abolition of the matching contribution principle is linked with the principle that all public sector pension plans should be subject to the Pension Benefits Act. It is not sufficient merely to adopt this principle in general. The specific acts outlining the plan provisions as in the case of the Teachers' Superannuation Act and the Public Service Superannuation Act will have to be amended extensively.

In addition to plan amendments, the legislation which empowers a government agency to establish a pension plan should be amended to provide specifically that the plan established under that statutory authority is subject to the Pension Benefits Act. If by interpretation, the Crown and its agents are not bound unless so stated in an act then the Pension Benefits Act should be amended to state specifically that the Crown and its agencies and the municipalities are bound for all pension plans by all the aspects of the Pension Benefits Act, rather than binding the Crown indirectly through the definition section of that act.

The Commission therefore recommends that:

The Pension Benefits Act be amended to specifically bind the Crown in the right of Ontario, its Crown agencies, its agents, its boards and commissions, and its municipalities to comply with the provisions of the Pension Benefits Act.

EXISTENCE OF THE FUND

The concept of funding implies the segregation of monies to create a fund. The fund is invested and the proceeds of the investments are added to the original fund assets all with a view to accumulating the amount required to pay all the promised benefits when they become payable. Segregation of the monies from those of the employer is a cardinal principle under the Pension Benefits Act for all plans in the private sector for the protection of employees against loss of the fund. Identification of plan assets through a fund also permits easy identification of investment proceeds. Most public sector plans also utilize a fund which is segregated from the employer's assets. The

notable exceptions are the PSSF, LARA, and the Superannuation Adjustment funds. Although TSF and OMERS hold non-marketable debentures of the Province of Ontario, the evidence of debt is sufficient to support the concept of the existence of a fund. However the degree of real segregation is at issue. The desirability of such investment procedures will be considered in detail in the next chapter.

The PSSF is a fund created under the act constituted as set out in Section 5(2):

> "The Fund consists of the moneys paid in by contributors and the moneys credited to the Fund out of the Consolidated Revenue Fund or otherwise in accordance with law, less the moneys paid out under this Act."

The act further provides for interest on the Fund:

> "5.(4) Interest shall be credited at the close of each fiscal year to the Fund out of the Consolidated Revenue Fund at a rate and in a manner to be determined from time to time by the Lieutenant Governor in Council."

The fund is not segregated physically from the Consolidated Revenue Fund of the Province of Ontario. It is reflected as a balance in the hands of the Treasurer of Ontario and is known as the Public Service Superannuation Fund Account. It appears in the financial accounts of the province as a credit to pension funds under Trust Administration Functions of the Statement of Non-Budgetary Transactions. Note 6 to the Financial Statements with the Public Accounts, 1978-79 states:

> "The Province of Ontario maintains accounts within the Consolidated Revenue Fund for all contributions and interest earnings less pension payments for both the Public Service Superannuation Fund and Legislative Assembly Retirement Allowances Account. The amounts recorded by the Province are essentially the sole assets of these pension plans."

In the Commission's opinion the Public Service Superannuation Fund should be established immediately as a fund separate from the Consolidated Revenue Fund and the Treasurer's Accounts. The employees are entitled to have their monies segregated and also to have the employer's money placed in a fund for investment. Once a separate fund is created, an investment policy can be undertaken which will result in real assets, providing financial security for the fund as well as a pool for capital investment apart from the control of the province. However painful the initial readjustment might be, the Commission believes that such a step is essential for an awareness of pension cost by both employer and employee and for the confidence of employees and the public in the security of the plan.

The Commission therefore recommends:

That the Public Service Superannuation Fund (PSSF) be established as a separate fund apart from the Consolidated Revenue Fund and the Treasurer's Account with an initial unfunded liability as of January 1, 1965 on which interest only is payable pursuant to Section 1(13) of the Pension Benefits Act regulations, with all other initial unfunded liabilities or experience deficiencies to be amortized by special payments in the usual way under the Pension Benefits Act.

A similar provision should be made for the Legislative Assembly plan if it is to be brought under the Pension Benefits Act as recommended.

FUNDING OF INDEXED BENEFITS

The general problems relating to the funding of indexed benefits were discussed in Volume II, Chapter 9. Desirability of indexing in periods of high inflation has created much discussion and some resentment in the private sector where employers have been reluctant to undertake any automatic indexing. The Commission's consumer survey showed however that there was little desire on the part of those in the survey sample to cut back indexing for public servants; rather the emphasis was towards requiring indexing in all employment pension plans.

Once the indexing of benefits becomes part of the promised pension, then the question of the funding must be addressed. As we have seen in Chapter 2, not all public sector plans are indexed in some fashion (HOOPP has no inflation adjustment). Many are adjusted on an ad hoc basis (Hydro has regular ad hoc adjustments). The most visible of the indexed pension plans are the PSSF and the TSF which provide for automatic indexing up to 8 per cent a year, paid from contributions into a separate indexing fund.

The Superannuation Adjustment Benefits Act

On July 18, 1975 the Superannuation Adjustment Benefits Act, 1975, (SABA)(1) came into force "to provide superannuation adjustment benefits to persons in receipt of pensions payable out of pension funds indirectly out of the Consolidated Revenue Fund." The act applies only to pension plans designated by the regulations under the act. To date four plans have been so designated:

Teachers' Superannuation Fund, August 30, 1975
Public Service Superannuation Fund, December 15, 1975
Ryerson Polytechnical Institute, July 27, 1977
Caucus Employees Retirement Plan, December 29, 1977

The act provides for indexing to the Consumer Price Index for Canada for the year ending September 30th to the extent of 8 per cent. Any increase beyond 8 per cent can be carried over to other years in which the increase in the CPI is less than 8 per cent. The adjustment is cumulative from year to year.(2)

The act requires a contribution of 1 per cent of salary from every employee who contributes to a designated plan. A like amount is contributed by the employer.(3) "Employer" is defined as the employer within the meaning of the pension plan.(4)

The Superannuation Adjustment Fund set up under the act(5) is held by the Treasurer of Ontario as a separate account in the accounts of Ontario, and receives the contributions from all the designated plans. A separate account is maintained for each plan. Interest is credited annually at a rate determined by the Lieutenant-Governor in Council from time to time. For the years 1978-79 the PSSF rate was 9.81 per cent for net amounts on deposit with the Consolidated Revenue Fund for a minimum of 10 years; for the TSSF, 9.95 per cent, 15 years minimum; for Ryerson and Caucus Employees, 10.06 per cent with a 20-year minimum.

The act segregates employees who have not made contributions, usually retired or terminated employees, from those who have made contributions to the Fund. Those who have made at least one contribution are entitled to payment out of the Fund. Those who have not contributed are entitled to the same adjustment but it is paid by the employer and not out of the Fund.(6)

In 1979, payments for PSSF pensioners for indexing quite apart from those who contributed under SABA, were as follows:

	(Millions of dollars)
Indexing of basic benefits	11.13
Indexing of ad hoc adjustments	3.04
	14.17

There is no provision for paying adjustments directly from the pension fund, and therefore these indexing costs are borne fully by the employer - in the case of the PSSF, from the Consolidated Revenue Fund.

Added to these indexing costs are the ad hoc adjustments made to pensions prior to 1975 for the same groups of employees, which are also paid out of the Consolidated Revenue Fund. These ad hoc adjustment payments amounted to $8.9 million in 1979.

Taken together, additional payments for indexing and ad hoc adjustments in 1979 for the PSSF totalled $23.07 million paid out of the

Consolidated Revenue Fund, or 1.86 per cent of payroll. In the TSF the same kinds of payments are made; they appear to be about double the PSSF amounts, but are about the same percentage of payroll.

Cash Flow Projections for the Adjustment Funds

Contributions to the Fund of 1 per cent from each of the employee and the employer are provided for expressly in the act, and no change in the rate may be made before January 1, 1981.(7)

The design of the Fund retains the principle of matching contributions. The fixed rate of these matching contributions raises the question of whether the true cost of indexing is actually being funded. Keith Cooper reports:

> "Cash flow projections performed by the Chief Actuary for the Ontario Government using two sets of inflationary assumptions, one grading from 7.2% in 1977 down to 4% in 1991 and later and the other assuming 8% inflation throughout, developed the following results for the Public Service Superannuation Adjustment Fund and the Teachers' Superannuation Adjustment Fund:

	Graded Inflation		8% Inflation	
	PSSAF	TSAF	PSSAF	TSAF
1. Year Cash Flow First Negative	1986	1987	1985	1987
2. Year of Maximum Fund	1989	1991	1986	1988
3. Year Fund First Negative	1996	1999	1992	1995

> "The calculations assumed a stable population throughout and were based on an assumed investment rate of return for new investments of 8% for 15 years and 6% thereafter. The salary scale and the graded inflation scale used are set out below:

Year	Salary Scale	Graded Inflation Scale
1977	6.00	7.20
1978	7.00	7.25
1979	8.00	7.00
1980	8.00	6.75
1981	7.00	6.50
1982	6.75	6.25
1983	6.50	6.00
1984	6.25	5.75
1985	6.00	5.50
1986	5.75	5.25
1987	5.50	5.00
1988	5.25	4.75
1989	5.00	4.50
1990	4.75	4.25
1991 and later	4.50	4.00

"These projections provide a picture of what the possible prognosis for these funds will be. Obviously, the present 1% contribution rate will have to increase. The problem is somewhat similar to that of the Canada Pension Plan where current beneficiaries are reaping a windfall at the expense of future generations of workers....Discussions with the Chief Actuary for the Ontario Government indicates that a study now being completed for the Ontario Treasury Ministry suggests that the current service indexing costs will be about 7% of earnings for the PSSAF and TSAF or about 5% of earnings above the present contribution level."

From the above projections it is clear that the rates of contribution will have to increase substantially in 1981 to fund the adjustments on the same basis as for other pension benefits. Section 2a of the Pension Benefits Act regulations provides that such escalation adjustments need not be prefunded so long as current payouts are covered as current service cost. However if the indexed benefits are not prefunded there are serious cost consequences for the future. The matching contribution principle means that the government may not be in a position to pay the full current service cost unless contribution rates are increased by regulation. Some pensioners are now receiving a large benefit for almost no contribution. Pensioners in later years, if inflation continues at high rates, run the risk of the fund running out, with the employees refusing to continue to pay contribution rates sufficient to keep the fund solvent. However appealing the thought of a pension indexed at 8 per cent for a 1 per cent contribution, the issue of the true cost must be faced. It is highly questionable to require a contribution from an employee for a scheme which involves so little security. On the other hand, if government sees itself in the position

of making up any shortfall in later years, then the appropriate changes should be made now in the statute, the benefit funded and the true cost revealed to the taxpayers. The scheme is contrary to the principle of the Pension Benefits Act in not segregating the Fund or funds from the Consolidated Revenue Fund.

The Commission has made its position clear (see Volume II, Chapter 9 on Funding) that all inflation adjustments should be funded in the same way as other benefits, whether provided in the public or the private sector. The reasons for funding in the public sector in the case of the Superannuation Adjustment Benefit Fund are both for cost control and security, since the government is not, in this scheme, agreeing to pay any deficits which may arise.

If the government as employer, in the four plans now designated under SABA, wishes to provide automatic indexing to a cap of 8 per cent it should be obliged to face the true cost of such a benefit and it may also require the employee to pay a portion of that true cost. In this way the employee, the employer and the taxpayer can judge the advisability and affordability of the benefit. The judgment is to be made by those parties and not by this Commission. The Commission merely makes reference to consideration of the need for indexing taking into account other sources of retirement income which are fully indexed, the proposed participating annuity option, and, as discussed in a later chapter, the relationship between public and private sector employee benefits.

The Commission therefore limits its recommendations to the method of paying for indexing and does not recommend that all adjustment should cease. The repeal of SABA would end entitlement for adjustment, but it is contemplated that the entitlement would be continued by incorporation into the separate legislation or plan document of the four designated plans.

The Commission therefore recommends that:

The Government of Ontario take immediate steps to phase out the Public Service Superannuation Adjustment Fund (PSSAF), the Ryerson Adjustment Fund, the Caucus Employees Adjustment Fund, and the Teachers' Superannuation Adjustment Fund (TSAF) and in due course repeal the Superannuation Adjustment Benefits Act. In the interim, payments for adjustment should continue out of the four adjustment funds with all payments to cease at December 31, 1981 and all funds from the contributions by employees and the government as employer to be transferred to the Public Service Superannuation Fund, the Ryerson Pension Fund, the Caucus Employees Retirement Fund, and the Teachers' Superannuation Fund respectively as of that date. Any unfunded liabilities created by this change should be treated as initial unfunded liabilities and be amortized over 15 years in the respective funds.

Post-retirement adjustments for persons who retired before January 1, 1976 and who are receiving post-retirement adjustments out of the Consolidated Revenue Funds of Ontario, continue on the present basis.

In the case of ad hoc adjustments made in public sector plans on a regular basis but outside the pension plan itself, the Government of Ontario take steps to bring such payments within the framework of the pension plan for cost identification purposes.

The Government of Ontario take no steps to adopt terminal funding for post-retirement adjustments or to extend the use of supplementary adjustment funds for the purpose of providing post-retirement adjustments outside the funding provisions of the Pension Benefits Act.

Although the Commission opposes the adjustment fund approach, it wishes to put forward some specific recommendations for these funds if the Government of Ontario is not prepared to abolish them, namely:

If indexing is to continue on the basis that it is paid out of a separate fund contributed to by government and employees on an equal basis:

a) the indexing promise is to be changed from the present 8 per cent cap with carry-over, so that the government responsibility is limited to its 1 per cent contribution to the SABA fund;

b) the SABA fund should be operated on a pay-as-you-go basis with each employee being clearly warned that adjustments can be made only to the extent of the fund, and that they may not receive an adjustment when they retire;

c) consideration should be given to making participation in this fund voluntary for the employee;

d) that this approach not be extended to the private sector.

In the Commission's opinion, the full cost of indexed benefits, whether fully funded, pay-as-you-go or regular ad hoc, should be determined and considered in assessing the burden which the government assumes for pension benefits for public sector employees.

PUBLIC SECTOR STUDY - COMPARISON OF FUNDING OF PUBLIC SECTOR PLANS

The public sector study clearly illustrates the difficulties present in comparing existing public sector funding policies and practices and hence costs. The following comments are based on the data assembled by Dr. Kelly and set out in Volume VII of this report.

(It should be noted that in his treatment Dr. Kelly was attempting to isolate the payments which were required to be made by the employer for all purposes of the pension plan except for administrative expense, and to express the total of these payments as a percentage of pensionable payroll. The results are set out in Tables 8.1-8.5 of the data in Volume VII. The terms "contributions" and "costs" as used in the tables are not entirely precise as far as actual contributions and total employer's cost are concerned.)

Employer Contributions

Employee contributions are fairly stable; increases, if any, are generally made at the time a major new benefit is introduced. Employer contributions, except in money-purchase plans, vary from year to year since they reflect amortization payments covering that portion of the unfunded liability which is not covered by employee contributions. In addition to deficiencies caused by large salary increases or benefit changes, they are also affected by investment returns and valuation methods and assumptions.

Higher-than-average contributions could be due to:

- costly benefit provisions with lower-than-average employee contributions, e.g., Hydro and WCB Plans;

- closed plans with high average age/service introducing major benefit enrichment and incurring large past service costs, e.g., Toronto Civic Employees and Firefighters Plans;

- inadequate actuarial assumptions in the previous valuation which have to be corrected in the current valuation, e.g., assuming a lower rate of increase in salaries relative to investment return than was actually experienced;

- conservative actuarial assumptions, e.g., assuming a higher long-term rate of increase in salaries, relative to investment return, than is reasonable (resulting in a fund surplus);

- the actuarial method used to determine plan liabilities: valuation methods such as level premium result in higher estimated liabilities (and costs) than those which take account of accrued benefits only. The PSSF, the TSF, the WCB, and a small number of municipal and university pension plans are valued on a level premium basis.

Lower-than-average contributions could be due to:

- poor benefit provisions;

- long service required for vesting, and high turnover of non-vested employees;

- actuarial assumptions which are not conservative (which would subsequently lead to higher-than-average costs because of required deficiency payments);

- a valuation method which takes no account of future service, particularly in a relatively new plan with a young work-force.

Year-to-year fluctuations in contributions are accounted for by some of the factors mentioned above, and by:

- the introduction of new benefits and/or extensions of coverage entailing large past service costs;

- variations in escalation payments, if these are financed on a pay-as-you-go basis;

- changes in actuarial assumptions, method or data base;

- changes in the amortization schedule of special payments to suit the plan sponsor's budget requirements.

For all of these reasons, comparisons of costs between plans have to be viewed with considerable caution and it is very difficult, unless there is one obviously dominant factor, to draw conclusions as to why costs in one plan are higher than those in another or even to explain why costs have risen in a particular plan.

With few exceptions, the Public Sector Study questionnaire provided adequate information on historical amounts of employee and employer contributions. Unfortunately, in many instances, efforts to relate the contributions to the earnings of the plan members were unsuccessful due to the absence of comparable data on the covered payroll.

In a majority of plans (18 of 34) the employer's cost in 1977 was less than 8 per cent of pensionable payroll, though the heaviest concentration was in the 6 - 9.9 per cent range. In three plans, employer cost was far in excess of any others. These were the ONTC plan, in which the employer's cost was 20.2 per cent of pensionable payroll, including deficiency payments of 15.7 per cent; the Toronto Firefighters' Plan, in which the employer's cost amounted to 21.6 per cent, including deficiency payments of 14.1 per cent; and the City of Toronto Civic Employees' Plan, to which the employer paid 26.5 per cent including deficiency payments of 19.5 per cent. The latter two are closed plans which have incurred large past service costs as a result of benefit improvements. The high ONTC costs would appear to be explained by the employer's adherence in recent years to a relatively low current service contribution rate of 4.5 per cent, a rate that has obviously

been supported in actuarial valuations but which has resulted in increasingly high deficiency payments.

Among the major plans, Ontario Hydro had the highest employer cost in 1977, as in most years since 1971, amounting to 15.5 per cent of pensionable payroll. The basic provisions of the Hydro Plan are much the same as those in other major public sector plans, but employee contributions are lower. For the TSF, employer cost amounted to 13.7 per cent in 1977, an amount which can be attributed, in part, to inadequate actuarial assumptions in previous valuations and resulting large deficiency payments. For the PSSF the figure was 9.9 per cent. In HOOPP, the employer cost in 1977 was 7.7 per cent, a figure that actually seems quite high considering the high termination rates in the plan, the fact that no cost-of-living adjustments have been made, and that costs do not include projected service. Employer cost in OMERS is in the neighbourhood of 7 per cent.

A comparison of cost figures received in the study questionnaire for 21 plans which provided data back to 1971 shows that in 13 of these plans, employer cost rose between 1971 and 1977 while in the others it declined. In four of the major plans, employer cost rose: from 6.2 to 7.7 per cent in HOOPP; from 8.6 to 13.7 per cent in the TSF; from 9.2 to 9.9 per cent in the PSSF; and from 14.2 to 15.5 per cent in Hydro. Further consideration of these figures is undertaken in the chapter on costs.

ASSETS AND LIABILITIES

The estimated liabilities of pension plans are affected by the actuarial methods and assumptions used in the valuations. The effect of differences in actuarial methods is illustrated by a comparison of PSSF liabilities in 1976 when calculated on an accrued benefit projected basis and on a level premium basis. In the first case, the plan's liability would have been $1,562.3 million, and in the second case (the basis actually used for valuation) it was $2,617.8 million - a figure 67 per cent higher. In order to show liabilities on the same basis for all final average plans in the Ontario Public Sector, the accrued benefit projected method has been used throughout in the tables that follow. (These figures are not necessarily the same as those in Keith Cooper's report since the method used in the assessment is somewhat different.)

Although this adjustment removes one of the obstacles to meaningful comparison of liabilities, it does not eliminate all of them. First, use of the accrued benefit projected method does not resolve the problem of meaningful comparison of the liabilities of final average versus updated career average plans. In many career average plans, even where benefits are updated regularly, actuarial valuations of such plans do not necessarily take future salaries or service into account, with the result that a final average plan providing the same benefits could have

valuations showing liabilities 15 to 30 per cent higher than a regularly updated career average plan.

Secondly, and of wider significance, is the problem of adjusting for differences in actuarial assumptions underlying plan valuations. Some differences in actuarial assumptions reflect such factors as the employer's investment policy and personnel practices, while other differences tend to be more subjective. In any case, these differences can have a considerable effect on estimated liabilities. For example, Dr. Kelly notes that in a final average plan, an assumption of a 5 per cent long-term investment yield and a 5 per cent rate of increase in salaries would result in liabilities (and required contributions) close to 50 per cent higher than an assumed 8 per cent investment return and a 5 per cent increase in salaries.

Table 2 shows the assets and liabilities of the 20 largest public sector plans, ranked by size of fund. In most of the plans, including the five major ones, the figures for both assets and liabilities are given as of December 31, 1977 or December 31, 1978. In other plans, the figures are given for an earlier date in 1977, while in some the dates to which the figures relate do not coincide, the assets generally being shown as of December 31, 1977 and the liabilities as of six to twelve months earlier. Where the figures are taken as of the same date, the ratio of assets to liability is shown, using the higher of book or market value in cases where both values are available. Dr. Kelly noted that in general, there was very little difference between the book and market value figures, usually no more than 2 or 3 per cent. The major exception was Ontario Hydro, in which the market value of the fund was 9.6 per cent higher than the book value.

Table 2, taken from the public sector study, is based on answers to the questionnaire. It is useful in that it attempts a comparison of a large number of public sector plans on some consistent basis. The Commission has not relied entirely on the information in the table since more precise actuarial assessment reveals discrepancies in some of the figures. For example, the Workmen's Compensation Board had assets written up in the actuarial valuation of $73.5 million and liabilities of $54.8 million resulting in a ratio of 134 or a surplus funding position. However the comparisons are helpful, within their limitations, in obtaining an overall picture of assets and liabilities of public sector plans and also in showing the difficulties in comparing public sector plans from information sources currently available.

Table 2
Ontario Public Sector Assets and Liabilities of Pension Plans

Pension plan	Size of the fund		Liability of the plan	Ratio of assets/ liability(a)
	Book value	Market value		
	(Millions of dollars)		(Millions of dollars)	(Per cent)
Teachers' Superannuation Fund(b)	3,370.5 as of December 31, 1978	Non-marketable	5,095.8 as of December 31, 1978	66.0
Public Service Superannuation Fund	1,459.0 as of December 31, 1978	Not applicable	1,870.2 as of December 31, 1978	78.0
Ontario Municipal Employees Retirement System(c)	1,079.0 as of December 31, 1977	85% non-marketable	919.0(e) as of December 31, 1977	117.4
Ontario Hydro	970.5 as of December 31, 1978	1,063.7	1,073.1 as of December 31, 1978	99.0
Hospitals of Ontario Pension Plan	748.1 as of December 31, 1978	757.5(f)	831.3 as of December 31, 1978	91.0
University of Toronto	141.3 as of June 30, 1977	138.4	151.7 as of June 30, 1977	93.1
Colleges of Applied Arts and Technology	130.8 as of December 31, 1977	131.3	102.7 as of January 1, 1977	
Toronto Transit Commission	122.8 as of December 31, 1976	117.5	151.2 as of December 31, 1976	81.2
Metro Toronto Civic	117.5 as of December 31, 1977	114.2	250.7(e) as of December 31, 1977	46.9
Metro Toronto Police	108.3 as of December 31, 1977	99.9	215.3(e) as of December 31, 1977	50.3
City of Toronto (Civic Employees)	93.2 as of December 31, 1977	86.3	176.2 as of December 31, 1976	
City of Ottawa	67.2 as of December 31, 1977	63.2	69.7 as of December 31, 1977	96.5

Table 2 (continued)
Ontario Public Sector Assets and Liabilities of Pension Plans

Pension plan	Size of the fund		Liability of the plan	Ratio of assets/ liability(a)
	Book value	Market value		
	(Millions of dollars)		(Millions of dollars)	(Per cent)
Workmen's Compensation Board	64.4 as of December 31, 1977 (Actuarial value: 73.5)	64.0	54.5 as of December 31, 1977	135.0
Ontario Northland Transportation Commission	45.7 as of December 31, 1976	45.1	108.3 as of December 31, 1975	
McMaster University (Contributory) Plan)	43.3 as of December 31, 1977	43.1	124.4(e) as of June 30, 1977	
Queen's University	39.7 as of December 31, 1977	39.1	5.2(d)(e) as of August 31, 1975	
University of Ottawa	39.4 as of January 1, 1977	38.5	41.8 as of January 1, 1977	94.0
University of Waterloo	35.6 as of December 31, 1977	36.6	43.2 as of December 31, 1977	84.8
York University	35.6 as of December 31, 1977	36.0	18.0(d)(e) as of December 31, 1976	
University of Western Ontario - Academic Plan	31.7 as of December 31, 1977	31.8	28.5 as of July 1, 1977	

a Ratio not given where asset and liability data not as of the same date.
b The liabilities figure was estimated on accrued benefit projected method and updated to December 31, 1977, assuming an 8 per cent increase in active employee liability in the year 1977.
c The liability for OMERS has been calculated on the career average plan rather than the new final average plan in effect since January 1, 1978.
d Refers to the minimum guaranteed portion of a money-purchase plan.
e Includes liabilities for future service.
f Actuarial value of fund assets on hand as of December 31, 1978.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data," Tables 9.1-9.10.

As Table 2 shows, the ratio of assets to liabilities varies widely, ranging from less than 50 per cent in the Metro Toronto Civic Plan (which, as noted, had deficiency payments amounting to 19.5 per cent of pensionable payroll in 1977) to 96.5 per cent in the City of Ottawa plan.

The dominance of the five major plans is indicated by the fact that these accounted for 80 per cent of the assets and 81.5 per cent of the liabilities of all public sector plans (excluding money-purchase plans, in which liabilities by definition are equal to the assets on hand, and a few small plans for which information was not obtained). These figures, it must be stressed, are no more than approximations since - apart from differences in the way liabilities are calculated - this calculation ignores differences in the dates to which the assets and liability figures relate. The figures, however, give some impression of the relative importance of the major plans.

Subject to the same qualifications, Table 3 provides an indication of the magnitude of assets and liabilities by sub-sector and for the public sector as a whole. The influence of the major plans is evident in variations in the ratio of assets to liabilities between sub-sectors.

Table 3
Ontario Public Sector Assets and Liabilities by Sub-sector, 1977(a)

	Assets	Liabilities	Ratio of assets/liabilities
	($ millions)	($ millions)	(Per cent)
Provincial government	1,347.2	1,866.5	72.2
Municipal government	1,684.6	1,909.9	88.2
Health	659.7	757.2	87.1
Provincial utilities	957.7	1,158.3	82.7
Education	2,960.2	4,747.0	62.4
Total	7,609.4	10,438.9	72.9

a Figures are for the end of December 1977 as far as these were available. See detailed data in Table 2.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

Actuarial Valuations

Several comments were expressed to Dr. Kelly about actuarial valuation methods and assumptions and their implications.

The OTF stated that it was extremely concerned about the different assumptions used by different actuaries and about changes in assumptions from one valuation to another. The teachers said they would not change the current assumptions used for their plan; they make the plan more

conservative and perhaps safer. However, if the assumptions used in the latest (1975) valuation had been the same as those used in 1972, the plan's unfunded actuarial liability would have been one-half billion dollars less. In a supplementary document, the OTF noted that the change in actuarial assumptions in 1975 increased pension costs by 20 per cent, and it was estimated that the 1972 modifications in assumptions increased pension costs by about 30 per cent. Thus, within a span of a few years, it was deemed appropriate to assess the future cost of teachers' pensions at a 50 per cent higher level.

The supplementary document submitted by the OTF pointed out that benefits for teachers' service to date are close to being fully funded and that this financial position of the fund has continued to improve in recent years. It noted, too, that there was no actuarial agreement that funds like the TSF ought to aim for full funding of their pension obligations by the time contributors reach retirement. The pension security of Ontario's teachers rests ultimately on the provincial government's ability to pay the amount by which current benefits exceed current revenues from teacher contributions. The primary purpose of an actuarial valuation is therefore to obtain a fair measure of the future tax burden on Ontario residents. To date, the OTF added, the fund has been a source of financial support to the provincial government, and cash flow projections for the next decade indicate that revenue from teacher contributions will continue to be more than sufficient to meet the fund's total outflow.

Other employee groups which expressed views on the subject of actuarial valuations were OCUFA, the University of Toronto Faculty Association, and CUPE. OCUFA maintained that the failure of actuarial assumptions to match with reality was a matter of concern, while the University of Toronto Faculty Association stated that it would like to see variations in the degree of optimism used in actuarial projections about fund performance and salary increases, and an attempt at some form of impartial test valuation. CUPE noted that, in the past, the assumptions used by actuaries had not been subjects of contention. But since these assumptions have a tremendous effect on the costing of pension plans, it was expected that they would be negotiable in the future. It added that steel and auto workers unions had negotiated the actuarial assumptions of pension plans in the past and that currently there was a strike in the United States because of a disagreement about the assumptions used - the disagreement being over a difference of about 1/4 per cent in the interest rate.

A.W. Reeve, Executive Director of OMERS, stated that, despite all the explanations given by the actuaries, there was a strong feeling that pension plans are currently overfunded. For example, in OMERS, there were 47,000 employees who had retired or otherwise withdrawn from the pension plan but only 2,000 to 3,000 were receiving any sort of pension. The rest had just taken their money back. Mr. Reeve added that there was no study available showing the accuracy of past valuations in

predicting reality, and it might be that some special model was needed in order to be able to predict the future better.

Plan Valuation and Liabilities

Employees in the Ontario public sector are members of the following broad categories of plans: final average salary - 95.5 per cent; updated career average - 3 per cent; money-purchase - 1.5 per cent.

Final average plans - because their costing must take into account future salary increases - present the greatest challenge to the actuary, and offer the maximum opportunity for judgment and innovation in selecting and applying assumptions (see Volume II, Chapter 9).

Career average plans are less difficult to cost, since their benefits are based on known earnings - that is, up to the time of the valuation. Where such a plan is updated, on a regular or a once-only basis, it becomes in effect a final average plan (at least temporarily). The actuary's task is not rendered more difficult, however, since the salary base for accrued benefits is simply raised from one known level to another, more current level. Compared with a final average plan, the valuation results will show a significant difference. Because an updated career average plan makes no explicit promise of future updating, the actuary need not make any assumptions involving the likelihood or magnitude of future salary increases. In this way, an updated career average plan may show a distinctly lower cost at any given time than a final average plan, and at the same time produce equivalent levels of benefit. Costs in the longer run should favour the final average arrangement; but the deferral of cost under a career average plan may be attractive to some employers.

Since final average pension formulas generally appeal to employees, their higher immediate cost has not prevented their being widely adopted - in the private as well as the public sector. Employee satisfaction is not always based on the same perception of these types of plan, however. OMERS members, for instance, have expressed some dissatisfaction with the recent change from a career average to final average benefits. Many feel that the former provided a higher benefit at a lower contribution rate.

Money-purchase plans, by their nature, are fully funded and need no comment.

Valuation Assumptions

Forty-six valuations were reviewed, covering all plans in the Ontario public sector that are not money-purchase plans.

These valuations were made by fourteen different actuarial firms, and the assumptions varied considerably. Examples of some of the as-

sumptions relating to salary and interest, withdrawals and projections of the Year's Maximum Pensionable Earnings under the CPP illustrate the extent of these variations.

There were wide variations in assumptions for inflation in both investment return and salary projections. The average figures were about 4-1/2 per cent for salaries and 6 per cent for investment return. Other valuations used differentials of 1 per cent, or 0 per cent.

Withdrawal rates assumed can make a significant difference in liability calculations, particularly when the accrued benefit method is used. Some valuations based these rates on age alone, some on age and service, some on tables not directly related to the experience of the plan, and some took no account of withdrawals.

The rate of the YMPE increase is established by legislation; yet at one end of the scale there were assumptions of 12-1/2 per cent for years to 1980 or 1983 and 4 to 5 per cent thereafter, and at the other, assumptions of 0 to 5 per cent for all years from 1977.

There were other differences in the assumptions used, but the above examples will show that the liability figures shown in Table 2 give only a very general indication of the obligations of these plans.

Book and Market Value of Assets

The ratio of funding to liabilities was also not given on a consistent basis: some pension plans indicated that the market value of assets was not available, while others showed market values (see Table 2). This did not affect the funded ratio of the Public Service Superannuation Fund or the Teachers' Superannuation Fund, but it could have significantly affected the funded ratio of all other plans, especially if assets were valued on the basis of capitalized values for fixed income assets.

MANAGEMENT BOARD GUIDELINES

Disparities in funding methods and actuarial assumptions were of concern to the government before the appointment of this Commission. An attempt was made to bring some consistency to the valuation of public sector plans by developing guidelines in consultation with the actuaries of the five major plans. These guidelines were approved by Management Board in November, 1976. They were intended to apply first to the five major plans and to be amended in the light of experience before being applied to other plans in the public sector. The complete text of the Guidelines is printed as Appendix B to Keith Cooper's report in Volume VII.

The guidelines require: complete disclosure of all pertinent facts; valuations based on projected as well as accrued benefits; and ten-year cash flow projections using short-term assumptions which are realistic in each case - rather than relatively realistic as a package, which often applies to long-term assumptions. The Public Service and Teachers' pension plans have already modified their computer data banks and programs to meet the guideline requirements, and it is anticipated that the other major plans will do so.

As is noted in the preamble to the guidelines:

> "The guidelines for the valuation of public sector pension plans do not attempt to establish the basis for the triennial pension plan valuation required under the provisions of the Ontario Pension Benefits Act. They are intended to provide the basis for a common approach to the valuation of pension plans related to the Ontario public sector."

Such guidelines are the first step towards some consistent policy. At the other end of the spectrum is the approach of the U.S. Department of Labour which has proposed changes requiring uniformity for actuarial reports filed annually by employee benefit plans. The proposed changes include:

(i) a requirement that actuaries use only one method to report the present value of accrued benefits;

(ii) a requirement to indicate the actuarial methods and assumptions used; and

(iii) a requirement to report the present value of vested benefits and accrued non-vested benefits based on current compensation levels and entitlements.

The Commission would adopt a middle course between these two approaches. It rejects the idea of only one method for reporting. It has recommended that the public sector plans use one of two methods, recognizing that cost control may require a choice. It would go further than the guidelines, however; it would lay down specific requirements for the valuation of public sector pension plans under the Pension Benefits Act, and would apply those requirements immediately for all the plans. Areas not covered by specific requirements should be covered by guidelines similar to those of Management Board, particularly for an ongoing assessment of the funding status of the plans and their cost. Recommendations for these guidelines are set out in Chapter 5 (Present and Future Costs).

The Commission recommends for all public sector pension plans as applicable that:

The Pension Benefits Act and regulations be amended to require that all pension plans in the public sector having assets of $150 million or more file an annual actuarial valuation with the Pension Commission of Ontario within nine months of the fiscal year end of the plan.

The Government of Ontario take immediate steps to place all public sector pension plans on the same fiscal year end and to co-ordinate the filing of actuarial valuations so that those plans reporting triennially will all report for the same period.

For actuarial valuations of all public sector plans, a basis for actuarial assumptions be prescribed as follows, with the assumptions derived from such basis to be subject to the approval of the Pension Commission of Ontario:

a) the investment rate of return, setting out separately:

   (i) the inflation rate forecast for pension purposes by the Treasurer of Ontario;

   (ii) the real rate of return;

   (iii) the risk factor, provided that where the fund is invested in Canada or Ontario debt instruments no risk factor be taken into account; where the fund is invested in other market securities, all factors to apply; where the fund is invested in both categories of investment, the applicable rate be applied to the appropriate portion of the fund;

b) the salary scale, setting out separately:

   (i) the inflation rate, being the same as that used for the investment rate of return;

   (ii) merit increases;

   (iii) productivity;

c) the YMPE set for the year by Canada Pension Plan legislation,

and that decremental assumptions for mortality, disability, and terminations be assessed against actual experience every three years for each of the PSSF, TSF, HOOPP, Hydro, and such others which become large enough to produce significant results, and that such assumptions be set by the plan actuary taking into account such actual experience, and that for this purpose a regular demographic forecast be undertaken by the Government of Ontario for each plan, and data maintained for assessing the experience of the plan against the forecast.

The Commission is not in favour of removing from the judgment of the actuary areas where judgment is clearly needed. It does however seek to remove areas of inconsistency such as those found in varying inflation rates between rates of investment return and salary projections and in use of a YMPE other than those set by legislation. It should be noted that the interest rate as such would not be fixed under the Commission's recommendations; rather, the inflation element of the rate would be fixed. It seems to the Commission that the Treasurer is in the best position to make a forecast of the inflation element to be used for all public sector plans. The overall interest rate determined for the plan by the actuary would continue to be subject to the approval of the Pension Commission of Ontario.

Once the funding patterns of the public sector plans are put on a more consistent footing, both for the individual plan and for all the plans, it will be possible to achieve a more realistic assessment of the cost of the plans than has hitherto been possible.

NOTES

(1) The Superannuation Adjustment Benefits Act, 1975, 1975 Statutes of Ontario, Chapter 82.

(2) Ibid., section 4.

(3) Ibid., section 8.

(4) Ibid., section 1(1)(a).

(5) Ibid., section 10.

(6) Ibid., section 11.

(7) Ibid., section 13(2).

LIST OF TABLES

Table 1 - Funding Status of Six Major Public Sector Employment Pension Plans in Ontario 68

Table 2 - Ontario Public Sector Assets and Liabilities of Pension Plans 88

Table 3 - Ontario Public Sector Assets and Liabilities by Sub-sector 90

Chapter 4

Investment

INTRODUCTION

Funding and investment go hand in hand in pension planning. The assets accumulated by contributions required by the funding pattern are invested to create further assets to pay the eventual benefits. Because public sector plans have adopted the same funding techniques as private sector plans, return on investments has come under scrutiny by both the public and the plan members. Investment performance affects the cost for the taxpayer, and security and potential benefit improvements for plan members.

The practice of crediting "special accounts" in the Consolidated Revenue Fund and the use of non-negotiable debentures to represent assets have been criticized on the ground that investment returns are below the level which could be reasonably expected from market investment. The Commission therefore examined both practices and yields in public sector plans.

CURRENT INVESTMENT PRACTICES

A discussion of pension fund investment practice in the Ontario public sector must begin by drawing a basic distinction: all plans have investments, and most plans invest like private sector plans - that is, in financial market instruments. Some hold only non-marketable debt instruments of the province. Not all plans are totally in one category or the other. OMERS started out by investing only in non-marketable debentures, but in recent years has begun to diversify its portfolio and is gradually beginning to look and act more like a private sector plan.

For those plans that invest through financial markets, there is a further division: most of the smaller plans fund through insurance company guaranteed annuities or deposit administration plans. These insured or partly-insured plans cover only a small proportion of the persons covered in public sector plans, although about one-third of the plans are in this category. The only large plans to use this approach are the two pension plans of the University of Western Ontario, which had, in total, more than 70 per cent of the assets invested in this manner by public sector plans.

The investment of the pension fund assets falls within one of the following categories: non-marketable, market, and deposits with insurance companies.

Non-market Investing

The Public Service Superannuation Fund, the Legislative Assembly Retirement Allowances, and the Teachers' Superannuation Fund are now the only plans to use this approach exclusively. (Funds under the Superannuation Adjustment Benefits Act are also handled this way). Nevertheless, these funds loom so large in terms of the public sector and as a proportion of all Province of Ontario debt that they warrant close consideration. The assets of these funds are included in Table 1.

As at March 31, 1979, the province's accounts showed a liability of $1.551 billion in respect of the PSSF, compared with $1.324 billion a year earlier. This shows simply as an account within the Consolidated Revenue Fund, and no further segregation of the assets of this fund occurs. Interest is credited to this accounting entry amount at rates determined by the Treasurer. That interest rate has risen steadily. In 1965 the rate was 4.8 per cent. Annual deposits thereafter earned 5 per cent until 1971 when they rose to 6 per cent. In 1973 a formula was set for the fund which provided that interest credited on annual deposits would equal the weighted average yield of new bonds issued by or guaranteed by the province in Canadian dollars during the fiscal year. The effect of this formula was that by 1976 the return on the total fund had risen to 7.6 per cent and it will be much higher by now.

The other plan which uses this book entry approach is the Legislative Assembly Retirement Allowances. As at March 31, 1979, this account stood at $16 million, compared with $12 million a year earlier.

These two funds and the SABA funds do not really exist as separate entities in terms of having actual investments over which the fund has any control. The Teachers' Superannuation Fund is different in that it does have actual holdings of special Ontario debt instruments. As at December 31, 1978, its portfolio stood as follows:

	Thousands of dollars
Province of Ontario debentures at cost:	
6% due November 1, 1982	$ 74,200
6% due November 1, 1987	176,000
6% due November 1, 1992	454,500
8.57% due May 1, 1996	18,000
8.57% due November 1, 1996	74,000
8.57% due January 1, 1997	18,000
8.57% due March 30, 1997	62,000
7.86% due May 1, 1997	25,500
7.86% due November 1, 1997	84,500
7.86% due January 1, 1998	9,500
8.06% due April 2, 1993	50,000
8.06% due May 1, 1993	32,000
8.06% due October 1, 1993	5,000
8.06% due November 1, 1993	92,000
8.06% due January 1, 1994	16,000
8.39% due April 1, 1999	2,600
8.39% due May 1, 1999	46,000
8.39% due September 30, 1999	40,000
8.39% due November 1, 1999	117,000
8.39% due January 1, 2000	80,500
10.04% due May 1, 1995	50,000
10.04% due November 1, 1995	119,500
10.04% due January 1, 1996	28,000
10.11% due May 1, 2001	59,000
10.11% due November 1, 2001	74,000
10.11% due January 1, 2002	132,000
10.11% due February 1, 2002	10,500
10.11% due March 1, 2002	17,500
10.11% due March 31, 2002	41,500
9.82% due May 1, 2002	62,000
9.82% due November 1, 2002	80,000
9.82% due January 1, 2003	230,000
9.82% due January 1, 2003	108,000
9.82% due March 30, 2003	8,000
Deposits with the Province of Ontario to be used in purchasing Province of Ontario debentures	187,719
	2,685,019
Accrued interest	63,022
	$ 2,748,041

Source Teachers' Superannuation Commission, Report to Contributors for year ended December 31, 1978.

Using these year-end 1978 data and comparing them with the Public Accounts three months later, we find that Ontario debt instruments held by the Teachers' Superannuation Fund formed about 28 per cent of the outstanding net debt of the province. Adding in the amounts stated as owing to the PSSF and LARA at that date, approximately 45 per cent of the debt of the province was owed to these three funds.

OMERS is a special case. From January 1, 1963 to December 1, 1974, all investments were in non-marketable Ontario debentures. From January 1, 1975 to December 31, 1978, investments were in marketable and non-marketable securities. Since then all funds have been invested in the open market.

At December 31, 1978, OMERS held $1.293 billion in non-marketable debentures (which would have represented about 13 per cent of outstanding net debt of the province). Average term of the debt was 21 years, and the average interest rate was 9.07 per cent.

Market Investing

Some large pension plans, university pension funds, and those with independent investment management policies invest in conventional fashion; that is, the funds hold marketable bonds, short-term deposits, stocks, and mortgages. Not all funds invest in all these asset classes, but most have the kind of diversification characteristic of private sector plans generally.

The Ontario Hydro plan showed a market value portfolio at December 31, 1978 of $992 million, with the following approximate distribution:

	Per cent
Bonds	27
Stocks	31
Mortgages and real estate	29
Other	13

The Hospitals of Ontario Pension Plan had $775.75 million market value at the same date, of which the approximate distribution was as follows:

	Per cent
Bonds	46
Cash and accrued items	4
Stocks	32
Mortgages	18

HOOPP and Hydro's asset mixes were typical of private sector plans' asset mixes at that time.

Of the other major public sector plans, the universities (except the University of Western Ontario) invest in diversified portfolios, in most cases using professional investors to manage their portfolios. Asset mixes vary depending on the willingness of individual plans to invest in equities but, as a group, the universities invest in much the same way as private sector plans. The Workmen's Compensation Board in its December 31, 1978 report showed a $73 million portfolio at book value, with bonds representing about 73 per cent, mortgages 12 per cent, and stocks 15 per cent.

Funds which invest in the market have independent investment management policies, exercised either through in-house groups or institutional investment managers. Thirty-three funds in this category are included in Table 1.

Deposits with Insurance Companies

This category includes the assets of most of the smaller plans and a few large ones. Table 1 includes data on plans which have only part of their funds invested with insurance companies.

Table 1 shows the amount and percentage distribution of investments in each sub-sector by type of investment instrument, as of December 1977 or latest available date. The table covers all the larger plans in each sub-sector, and the figures come close to representing 100 per cent of all plan investments. The classification by investment instrument had to be made in some cases on the basis of arbitrary assumptions, since the records of some plans provided much less detail than others or were classified on a different basis than specified in the public sector study questionnaire. Generally, the broader the classification (e.g., debt, equity, mortgages, short-term investments) the more accuracy may be assumed.

The dominant feature of the table is the large proportion of the fund portfolios accounted for by Ontario Treasury deposits or non-marketable provincial debentures in the various sectors: provincial government (95 per cent); municipal government (56 per cent), and education (84 per cent). In the health and provincial utilities sub-sectors, which are not subject to investment restrictions by specific legislation, a higher proportion of funds is invested in bonds than in other instruments - 43.5 and 35.5 per cent respectively. There is little difference between the two in the proportion invested in equities - 29 and 32 per cent respectively - but the health sub-sector has a significantly lower percentage of its assets in the form of mortgages and real estate, and a much higher proportion in short-term investments and cash on hand. The distribution of investments in all sub-sectors, excluding Ontario Treasury deposits and non-marketable provincial debentures, shows 44.7 per cent invested in debt instruments, 27.3 per cent in equities, 23.6 per cent in mortgages and real estate, 3.6 per

Table 1
Ontario Public Sector Pension Fund Investment Portfolio, by Sub-sector and Investment Instrument, December 1977 or Latest Available Date

Investment instrument	Government		Health		Municipal		Education		Utilities		Total	
	($M)	(%)	($M)	(%)	($M)	(%)	($M)	(%)	($M)	(%)	($M)	(%)
Debt (bonds)												
Public	29.6	2.1	88.8	13.8	230.2	14.1	26.6	.9	128.1	17.5	503.4	6.9
Private	18.9	1.4	191.1	29.7	196.7	12.0	83.2	2.9	132.4	18.0	622.3	8.5
Combined (no breakdown)							47.7	1.6			47.7	.7
Equity (stocks)	11.6	.8	185.9	28.9	122.0	7.4	163.5	5.6	233.6	31.9	716.6	9.8
Real estate					16.0	1.0	.6	(a)	.3	(a)	16.9	.2
Mortgages	7.9	.6	121.3	18.9	149.1	9.1	92.4	3.2	228.2	31.1	598.9	8.2
Other real estate and mortgage (no breakdown)							4.2	.1			4.2	.1
Short-term investments	1.3	.1	28.7	4.5	5.0	.3	22.3	.8	.7	.1	57.9	.8
Cash on hand	(a)	(a)	22.0	3.4	4.0	.2	8.4	.3	1.4	.2	35.8	.5
Other (accrued interest and net receivables)	(a)	(a)	.6	.1	2.1	.1	2.8	.1	8.9	.1	14.4	.2
Insurance company deposits			4.8	.7			1.8	.1			6.6	.1
Ontario treasury deposits or non-marketable provincial debentures	1,324.0	95.0			913.3	55.7	2,457.8	84.2			4,695.2	64.1
Total(b)	1,393.4	100.0	643.1	100.0	1,638.5	100.0	2,911.4	100.0	733.6	100.0	7,319.9	100.0
Number of porfolios included(c)	4		5		8		17		2		36	

a Indicates less than .1 per cent.
b Totals may not add due to rounding. Also figures summed do not correspond in all cases to the data in the Assets and Liabilities Table in the Funding Chapter, which may apply to a different date.
c Some pension plans did not provide information regarding their portfolios.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Plan Data."

cent in short-term investments and cash on hand, and .8 per cent in other instruments.

INVESTMENT YIELDS

The public sector study asked plan sponsors to provide information on investment yields for each of the last ten years, for both book and market values, taking into account investment and interest income, including capital gains and losses, less administration and other expenses. Although few plans were able to provide this information for each of the ten years, and most were unable to give yields on both a book and market value basis, it is possible to show average annual yields on one basis or the other for 20 plans over the period 1972-77 and for another eight plans over other recent periods of four to five years. For HOOPP, figures were obtained on both a market and book value basis for the 1972-1977 period.

As indicated in Table 2, plans in which yields are expressed on a book value basis showed higher rates of return between 1972 and 1977 than those in which the yields are calculated on the basis of market value. While none of the 13 plans using the book value method showed rates of return below 5.5 per cent, six of the nine using the market value method showed lower yields. Basically, this reflects the slump in market values in 1973-1974. The significance of differences in approach is illustrated by HOOPP, which showed a book value yield of 6.4 per cent and a market value return of 5.3 per cent.

In plans which gave yields for periods beginning after 1972, the average annual returns were somewhat higher, presumably because of the rising new money rates after 1972. Perhaps indicative of this, the TSF, which is subject to investment constraints similar to those for the PSSF, showed an average annual return of 7.6 per cent over the period 1973-1977 compared with an average yield of 6.9 per cent for the PSSF over the period 1972-1977. Other factors, however, could also have a bearing on relative yields, such as growth in active plan membership and in the number of pensioners, both of which affect the amount of new money available for investment.

Table 2
Ontario Public Sector, Average Annual Investment Yields, Selected Plans, 1972-1977

	Book value	Market value
	(Per cent)	
York University		4.3
Brock University		5.2
Kitchener-Waterloo Hospital		5.3
Queen's University		5.3
City of Toronto Firemen	5.5	
McMaster University Contributory Plan		5.5
Ontario Stockyards Board	5.5	
City of Toronto Civic	5.8	
University of Waterloo		5.9
University of Guelph	6.0	
Workmen's Compensation Board	6.1	
Ontario Hydro	6.3	
Hospitals of Ontario Pension Plan	6.4	5.3
Ontario Educational Communications Authority		6.6
Ontario Northland Transporation Commission	6.8	
City of Ottawa	6.8	
Public Service Superannuation Fund	6.9	
Nipissing University College	7.2	
Borough of York	8.1	
Ontario Municipal Employees Retirement System	8.3	
Hospital for Sick Children		6.2
1972-1976		
Kingston General Hospital	8.5	
Toronto Transit Commission	13.0	
1973-1977		
McMaster University Non-contributory Plan		6.5
University of Toronto	6.7	
Teachers' Superannuation Fund	7.6	
1974-1977		
Ryerson Polytechnical Institute	8.7	
Colleges of Applied Arts and Technology	9.0	
Wilfrid Laurier University		12.9

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Pension Study Data."

How well do the public sector plans do as investors? This question was frequently raised at Commission hearings and in briefs received from plan members, retirees, and unions.

Direct comparisons of fund performance with that of pension funds in the private sector are likely to be impossible, or at least misleading. For instance, funds whose assets are based on non-marketable provincial debentures or simply accounting entries do not lend themselves to performance comparisons with plans using conventional investments. Interestingly, published data for the former show yields in the mid-1970s well in excess of those generally reported by private sector plans, whose performance was severely affected by a sharp cyclical attrition in the market value of stocks and bonds.

Comparisons based on data produced by various commercial measurement services is possible only where a particular fund can be valued at market prices. Even those public sector funds which invest in the open market generally do not make public their rates of return on a comparative basis. Their statements show investment income, from which rates of return may be calculated, but these are misleading even for marketable bond portfolios unless price changes are shown; they can be very misleading for portfolios with significant equity content. The sharp rise in stock prices in Canada since 1974 has been accompanied by rising dividends, but pension funds have experienced most of their investment returns through capital appreciation, which may not show in the "interest received" category at all, or only if trading profits are realized.

Thus it is impossible to draw any conclusion about the performance of the public sector investments, except to observe that asset mixes would have been decisive in determining how well the portfolios performed. According to A.G. Becker (Canada) Ltd., the median annual rate of return on the various asset classes by Canadian pension funds in the four years ending December 31, 1979 was as follows:

	Per cent
Bonds	8.3
Mortgages	10.4
Canadian equities	20.1
Foreign equities	17.5
Total fund	12.8

Since the median Canadian equity exposure of the funds in the survey during that period was 34.4 per cent and the median exposure to foreign equities was 5.7 per cent, the likely investment performance of the various public sector plans could be derived from their investment in stocks. On that basis, funds not invested in the market have been

hurt in recent years, although this was assuredly not the case in the five prior years.

Interest rates on debentures held by the TSF are related to market rates on new provincial borrowings at the time the fund obtains a new debenture. This was not always the case, but the province has made extra payments to the fund and unilaterally raised the interest rates on previously issued debt instruments in order to make the fund's earnings approximate what it could have earned in the open market. (By Section 7(5) of the Teachers' Superannuation Act the debentures issued to the fund shall bear interest at a rate which is "not less than the weighted average yield to maturity of long-term securities issued or guaranteed by the Province payable in Canadian dollars and sold to the public during the Province of Ontario fiscal year next preceding the date of the debenture.")

The most recent actuarial valuation for the TSF used an assumed long-term rate of return for the fund of 7 per cent; the actuary valued the debentures held in relation to this assumed yield. Thus for purposes of the valuation, all debentures having a coupon rate of less than 7 per cent were included at a discounted value to reflect an assumed yield of 7 per cent, and those with a higher coupon were valued at a rate above par. The effect of this technique is that the fund has not suffered in recent years due to market deficiencies compared with bonds held by private sector plans and valued (by the actuary) at market. Many private sector plans use the same valuation technique as the TSF, and their investment experience would thus have corresponded to the TSF's in recent years to the extent of their holdings of long-term bonds.

Since the PSSF uses, in effect, a similar technique for setting the interest rate on new deposits, it is probable that the long-term rate of return of the two funds will be comparable. Why, then, does the PSSF not use non-marketable debentures to at least formalize its situation? Officials in the government advise that the PSSF practice is purely historical. The legislature decided in 1920 that the fund would be part of the Consolidated Revenue Fund, and the practice has continued.

The relevant question is whether rates of return on public sector pension funds have been lower than would have been attained under a different investment policy. In retrospect, it is always possible to identify investment policies that would have been more profitable than those which were followed. But it is also possible to point to policies that would have yielded poorer returns. Nevertheless, there is a legitimate question as to whether the returns earned on the PSSF and TSF have been as high as could reasonably be expected, considering that the yield on Ontario government bonds is lower than that which can be earned on such securities as corporate bonds and mortgages.

In theory, the higher return earned on the latter types of investment represents a "risk premium" and in the long run, according to theory, the net returns should be the same. In other words, say some economists, it should make no difference what one invests in. Yet the fact that, given the opportunity, pension plans do diversify their investments and pay for advice as to how to do this indicates that it does matter.

The view that pension funds should earn a return greater than that on the most secure types of investment was expressed by the late Dr. John Deutsch in his report to the Federal Minister of Labour as Commissioner of Inquiry into Railway Pensions in December 1973. Commenting on what the railway pension funds should be expected to earn, Deutsch concluded that

> "with reasonable investment expertise, the companies can be expected to earn a net rate of return on new money about one percentage point higher than the estimated long-term Canada bond rate, that is, a long-run rate of return of 8 per cent."

In calculating this net differential, which translated into earnings 14 per cent higher than the projected long-term Canada Bond rate, Deutsch was making a reasonable allowance for risk and investment management costs. Since the differential between long-term Ontario government bonds and long-term Canada bonds has been less than 14 per cent, it might be concluded, on the basis of Deutsch's view, that the PSSF and TSF should be yielding a slightly higher rate of return than they have achieved.

Current policy with regard to the investment of pension funds in the PSSF and TSF is much the same as that followed by the British Columbia government. However, in Quebec and some of the smaller provinces, employee contributions are invested partly in the private sector. In its 1978 budget, the Ontario government indicated that the OMERS private investment program is a prototype to be considered for the TSF when making a transition to private market investment.

THE OMERS EXPERIMENT

OMERS is moving from a totally passive approach of holding only non-marketable debentures to a conventional approach, with all new cash flow being invested in the open market.

Although this change only began in 1975, and although full commitment of new cash flow to the open market only began in 1979, the effects are already apparent. By year-end 1979, 36.9 per cent of the $2.052 billion (book value) OMERS portfolio was in marketable investments - bonds, mortgages, short-term deposits, and real estate. The rapid transformation of the asset mix is apparent when one realizes that the

marketable securities component rose 108 per cent in 1978 and 131 per cent in 1979, and is projected to grow at 50 per cent in 1980 and 40 per cent in 1981.

Operating under the guidance of an investment policy advisory board, the OMERS investment staff has built up this portfolio swiftly without distorting capital markets - in part because the equity investments have been so diversified. Of the $142 million (book value) in equities at December 31, 1979, $10.1 million was in Canadian mutual funds, $30 million in U.S. mutual funds, $3.6 in Pacific (Asian) mutual funds, $27.6 million in individual U.S. stocks, and just $65.8 million in individual Canadian stocks.

OMERS is being managed to provide secure pension benefits for its members, and the diversification of investments is being undertaken in pursuance of that goal. As such, OMERS will be a useful example if the other large public sector funds are permitted to invest in marketable securities in the same way as private sector funds.

THE PUBLIC'S VIEWS ON INVESTMENT

Two unions were critical of investment policies followed with respect to public sector pension funds. Along with two other employee groups, they proposed that there be greater diversification of public sector pension fund assets.

The Ontario Public Service Employees' Union (OPSEU), contending that the PSSF had been mismanaged, noted that private sector pension funds had diversified assets, and the bonds which they held were diversified with regard to their term structure. By comparison, PSSF assets were invested exclusively in 25-year non-marketable bonds (sic). It was the union's view that the government treats the public pension funds as a captive source of cheap capital; hence, pension funds have become a dumping-ground for low-yield securities that no one else would take. It added that the lower risk of provincial bonds cannot explain the difference in yield. The most secure mortgages have no greater risk than provincial bonds, but have a higher yield. OPSEU thought diversification should be accomplished through union control of the plan.

In its brief to the Commission (Brief 208), OPSEU observed:

> "One cannot but be intrigued by the portfolio composition of the private sector in contrast with the PSSF. Unless it is assumed that there are serious irrationalities or frictions constraining the private sector fund managers, one must conclude that by the standard of private funds, the PSSF portfolio is unbalanced.
>
> "The question of balance among various maturities also warrants attention. In a period of inflation, and especially in a period of

unpredictable inflation, pension funds try to acquire assets that preserve their real rate of return. Variable mortgages are one such instrument. Funds will also increase their holding of shorter-term assets. Yet in the case of the PSSF we witness a year-after-year policy of acquiring fixed term bonds of 25 years duration (sic). It is unimaginable that any privately managed fund would adhere to such investment strategy."

The views of the Canadian Union of Public Employees (CUPE) on this issue were outlined in its brief to the Commission (Brief 101). It stated that the provincial government, by excluding public employee pension funds from the legislative rules which pertain to the private sector, had created a preferred relationship for itself, a consequence of which is that public sector pension funds have had a distorted and, depending on market conditions, imprudent asset mix. This has done injury to the interests of both plan member beneficiaries and the taxpayer. The union proposed that public sector funds should be invested according to the same legislative guidelines and rules as are private sector plans and that the concept of fiduciary responsibility and the "prudent man" rule should be expressly outlined in the legislation applicable to both private and public sector pension funds. Co-management of pension fund assets was recommended.

Although not openly critical of government investment policies, the Ontario Teachers' Federation (OTF) advocated a more diversified policy with respect to TSF assets. OTF recommended more money be invested in the private sector, starting with perhaps 10 to 20 per cent of surplus funds in a given year. It was impressed with the high-calibre people that OMERS had been able to find to guide its pension investments. Given its desire that the government continue to be the guarantor of teachers' pensions, OTF would be willing to accept a provision for government approval of investment decisions in order to ensure that all investments are in high-quality, low-risk financial instruments.(1)

The Management Employee Group of the public service identified the exclusive use of pension funds by the government as one of the weaknesses of the PSSF, and recommended that part of the assets go into short-term securities. Greater diversification was also recommended by Mr. C.G. Millard, Northern College of Applied Arts and Technology, who suggested that at least some portion of the public sector pension funds should be invested similarly to the college's pension plan, trusteed by OMERS. The National Union of Provincial Government Employees was critical of the practice of governments across Canada in tapping public sector pension plans for general revenue purposes.

Several submissions commented favourably on the investment record of OMERS in recent years. Other briefs to the Commission supported the market investment of public sector pension funds:

Ontario Hydro in its Brief No. 299 recommended:

> "Pension fund investments, public and private, be directed largely into productive assets. Funds should be invested as much as possible in corporation bonds, mortgages, real estate ownership, equities, and those government bonds where there are indications that the funds will likely flow through to infrastructure.
>
> "Governments do more to indicate the purpose for which they are borrowing money through bonds issues."

Mr. D.A. Sheppard, Brief 143

> "... most of the pension funds in OMERS to date have been invested in government of Ontario bonds paying interest at less than fair market rates. This cheats the members out of a higher return on their investment, and provides the provincial government with a cheap form of debt financing (leading to larger borrowings and increased inflation?)."

Ontario Advisory Council on Senior Citizens, Brief 154

> "Public Service Employer-Employee Pension Plans
>
> a. In general these pension plans should be administered in accordance with the legislative requirements for pension plans in the private sector.
>
> b. Contributions should be shared equally by employer and employee, and should be sufficient to purchase benefits comparable to those available in similar pension plans in the private sector.
>
> c. All contributions should be deposited in a trust fund and administered outside the regular systems for general government receipts and expenditures. This trust fund should be subject to audit, perhaps by the Auditor General or his equivalent.
>
> d. These trust funds should continue to be available for government uses but interest at regular rates should be paid and deposited in the trust fund. Government borrowing from trust funds should be through procedures similar to those used by government for borrowing on the open market."

Canavest House, Brief 180

> "In the public sector, both national and employer level plans should be funded for the "cost visibility" reason and to create an aggregate capital stock which can provide future pensioner income in an era of increasing pensioner to active worker ratios.

"Public sector retirement saving should be allocated to investment uses through the normal capital market channels. This will ensure efficient allocation.

"Public sector retirement funds should be managed privately in the financial services sector with pre-established investment objectives. Fees should be established through competitive bidding."

Pension Investment Association of Canada, Brief 245

"Public sector pension plans should be financed, managed and invested in a similar manner as private sector plans. This would call for:

(a) full funding of public employee pensions,

(b) diversification of investment,

(c) investment in productive assets,

(d) use of capital markets, and

(e) an investment performance orientation.

"In this way, a significant portion of capital flows can be redirected out of the public sector, back into the private sector, where they are needed. It would also encourage Provincial Governments to compete for funds in the capital market as well as allowing public sector pension plans to earn market rates of return (versus government regulated returns). Forcing the government into the market will also encourage more productive uses of acquired funds (i.e., improving transportation, communication and energy development).

"In this way, the public would not feel their tax dollars were subsidizing public sector pension plans. Similarly, contributors to public sector pension plans would not feel they were subsidizing public programmes through limited investment alternatives."

Keith Cooper, in his report (see Volume VII), comments on the effects that the switch to market investment, which is so strongly advocated in the briefs to the Commission, would have:

"There are several observations to be made about the procedures being used by the Ontario government for handling the assets of the PSSF, PSSAF, and TSAF.

a) By investing funds externally, the government should be able to generate a larger investment return than it would have to pay for similar funds they would otherwise borrow on the

marketplace. This applies equally to the TSF. The OMERS experiment is truly supportive of this position.

b) By using real assets versus public debt, the government achieves at least the following two objectives:

- Plan members may experience a greater sense of security arising from the broader diversification of assets.

- Should any governmental entity experience cash flow difficulties overall, and thereby not be able to meet its financial obligations, a part of which would be the required payments to pension plan beneficiaries (after utilizing current employee contributions in this regard), then in the instance where "real" assets exist, such assets could be used to meet current commitments. In the case where public debt is used, the assets belong to the governmental entity and the interest or the repayment of such debt can only come out of current government revenues, which, if not available leaves the pension plan beneficiaries in jeopardy.

c) If non-public debentures were issued, then this would have the effect of increasing the non-budgetary deficit and the government's net cash requirements in an amount equal to the net pension flow through the Special Purpose Accounts. There would not be any change in the budgetary deficit.

The other beneficial effect of using non-public debentures would be that the government's outstanding debt would be more readily recognizable than is the case today. Under the present arrangements, the total Ontario debt can only be determined by adding to its funded debt (i.e. public debt and non-public debt) the value of its unfunded debt which includes the PSSF, PSSAF, TSAF Special Purpose Accounts, the deposits from the Province of Ontario Savings Office, and certain advances payable.

d) By accepting the net flow of funds from the various government pension plans (PSSF, PSSAF, TSF, TSAF, and previously OMERS), the government reduces its external borrowing needs. However, with decreasing future capital expenditures, there appears to be less need for these funds. Recognizing the desirability of having tax revenues pay for general expenditures and having capital expenditures come out of debt, it is incumbent on the government that they do not fall into the trap of deploying capital derived from net pension fund flows toward general expenditures or toward non-productive capital items. The government stated in its 1978 budget: 'In an effort to ensure the successful implementation of this redeployment of public funds from the public to the private sector, the Government

of Ontario initiated the OMERS experiment in 1975. This experiment has proven successful, and thought can now be given to instituting similar procedures for other sources of internal funds.' This intention is certainly healthy. The 1978 Ontario budget also stated: 'It (the investment of TSF funds privately) will not begin until after the report of the Ontario Royal Commission on Pensions has been received.'

The Ontario Government appears to be committed to deploying excess internally-generated pension funds to marketable securities. This position is healthy and should be encouraged."

SOCIAL AND ECONOMIC GOALS AND INVESTMENT

We have already noted the relationship between the build-up of economic resources in a country and the savings rate. We have also noted that pension funds do not constitute savings unless that government debt is invested in tangible assets that produce goods and services. Thus, a government bond issued to finance a school becomes part of the national savings process (unless the bonds were not acquired by a saver but simply monetized through excess creation of money by the Bank of Canada). In that sense, a school, a hydro plant, a factory, and a pipeline are all capital goods with long-range economic and social returns. Public sector pension plans which simply lend their reserves back to the government may not add to the provincial saving and investment process unless the government uses those funds for capital investment.

It is this latter factor which has been the subject of intensive economic analysis in studies issuing from TEIGA in recent years. These studies postulate that true savings produce two measurable rates of return: the income rate of return and the social rate of return.

A corporation contemplating the building of a new factory will conduct studies about the estimated rate of return on the capital invested in that project. The approach usually used by sophisticated corporate planners to select the capital investments which will actually go ahead is the "hurdle rate of return" concept, in which any major capital commitment must be shown to have the strong likelihood of generating a net after-tax rate of return that exceeds some pre-defined "hurdle" rate. Thus if, for example, the cost of capital to finance a project is 15 per cent then the hurdle rate of return would be at least 20 per cent. With that approach, competing capital investment recommendations from different operating groups within a company can be compared, and the most promising selected.

This may be compared with the social rate of return which is determined by adding the net after-tax rate of return of a corporation to the corporation tax paid. If that project in our example does in

fact generate an after-tax rate of return of 20 per cent (which would mean that it was far above the normal range of profitability of invested capital in Ontario), then, assuming a 50 per cent corporate tax rate the social rate of return would be close to 40 per cent.

It is this social rate of return which the TEIGA studies use as argument for the proposition that pay-as-you-go financing of the Canada Pension Plan is, in the long run, more costly than pre-funding, assuming that the reserves accumulated through pre-funding were invested in assets which generate a social rate of return. The Commission is not prepared to recommend total pre-funding for the CPP, for reasons discussed elsewhere. However, the TEIGA argument supports the position that the public sector pension funds should be invested productively.

Effects on the Capital Markets

The Commission believes that all public sector pension funds should be invested in the open market. These funds would strengthen capital markets generally, but would not inundate markets as a prefunded CPP would. To release these monies into capital markets would give added depth and liquidity to Canada's limited markets. Since the employees who contribute to these plans see their contributions as savings, and since the national accounts include such contributions in saving, they should be treated as saving and not as captive funds for government. These plans offer extremely generous benefits compared to most private sector plans, yet their existing investing process ensures that, in the long run, the funds will yield lower rates of return. Thus the ultimate cost to taxpayers is increased. Employees naturally are concerned that their contributions are not being invested as productively as they could be.

One objection to open market investment is that the province has become so dependent on these funds that any diversion of reserves into the open market will put severe strains on provincial finances. In fact, provincial treasurers have been aware of this incipient problem for some years; both the Hon. Darcy McKeough and the Hon. Frank Miller have publicly commented on the need for provinces to become "weaned" from their supply of captive funds. Some transition period will undoubtedly be necessary, but we believe strongly that the current use of non-market investing for the reserves of the PSSF, TSF and LARA should be discontinued. The same conclusion applies to SABA funds, in the event they are retained in the present segregated form.

A principal function of any transition period would be to avoid distortion of the capital markets. As noted above, OMERS has diversified sufficiently among Canadian, U.S., and foreign investments that its impact on Canadian markets has not been extensive. This is in contrast to the approach adopted by the Quebec Pension Plan in its operations through the Caisse de dépôt. The funds accumulated for the plan and in

the various provincial employee plans administered by the Quebec Pension Board have become major factors in the Canadian stock market.

If the Commission's recommendations for full disclosure of pension plan investments are adopted, the Commission believes that the dangers of using pension fund assets other than to earn the best return in relation to pension fund goals will be minimized.

Effect of CPP Investment Proposals

The Commission's proposals for the handling of the CPP fund will have important implications for provincial financing. In essence, they involve the maintenance of a contingency fund of twice the year's benefit and administration cost pay-out three years in advance (see Volume V). The funds in this reserve can still be long-term bonds because that reserve will grow. However, the funds are to be invested in real economic assets, not just passive debt, and through a roll-over plan the existing debt instruments are to be replaced by bonds having real backing. When this process is completed, the criticism that CPP has nothing but "ghost funds" will no longer be valid.

Although the Commission believes that only real assets should be used to secure future benefits, we are not recommending that CPP funds be invested through the open market. Rather, we suggest that the monies go into capital goods of Crown corporations, such as Ontario Hydro. Then the earnings of those capital goods can be used to finance the debt, rather than relying solely on future taxpayers. Other provinces also have utilities and Crown corporations engaged in performing basic economic functions that would provide a ready base on which these government bodies could raise funds needed.

Finally, the Commission's transition and roll-over proposals for the CPP permit both provincial treasurers and public capital markets to adjust to a new era in which provincial deficits can no longer be financed through relatively hidden sources of money. By providing for an orderly transition to greater financial discipline, no dislocation of bond markets should occur. Investors and treasurers will know years in advance the maturity schedules and refunding arrangements needed. By the turn of the century, both the CPP and provincial finances generally should be on a stronger footing.

RECOMMENDATIONS

The Commission is satisfied that the time has come for a radical change in the investment of assets in public sector pension plans. The financial implications for provincial finances may be disconcerting initially, but the results will be beneficial in the long run. Benefits should arise from:

1. separation of all pension fund assets from the regular accounts of the province;

2. improved and visible rates of return on pension fund assets;

3. greater amounts of capital available for private market utilization;

4. controls on public borrowing by virtue of government being required to borrow at market rates;

5. visibility of pension cost to government, taxpayers, and plan members;

The Commission therefore recommends that the Government of Ontario adopt a policy of investment for all public sector pension funds, including the funds to be created for the PSSF and the Legislative Assembly Retirement Allowances account, incorporating the following principles:

a) all investments should be in the form of marketable securities;

b) all funds and investments should be segregated from government funds, even on a short-term basis;

c) book entries such as those currently used for the PSSF, and non-marketable securities such as those now used for the TSF, should be discontinued and replaced as soon as practicable with marketable securities;

d) all future investments should reflect market rates of return;

e) some portion of the investment of a plan should be made in the private sector within the investment regulations of the Pension Benefits Act.

The adjustment of finances on the scale of those of the Province of Ontario is a delicate and difficult matter. As well as the recommendations for the Ontario public sector plans, the recommendations for CPP investing will have far-reaching effects on provincial financing. Accordingly, none of these changes can be made overnight. The gradual switch in OMERS investments provides a likely approach. However, some steps, such as segregation from the public accounts, can and should be undertaken now as part of the general restructuring of the pension fund accounts.

NOTES

(1) Keith Cooper comments on this point in his report (see Volume VII):

> "It should also be noted that the Ontario government guarantees the PSSF and TSF plans in its role as 'employer.' Before it can permit the assets of the TSF to be invested in marketable securities, the various school boards in Ontario would have to accept responsibility for the liabilities of the plan for the teachers in their jurisdiction as the municipalities have done in the case of OMERS."

LIST OF TABLES

Table 1 - Ontario Public Sector Pension Fund Investment Portfolio, by Sub-sector and Investment Instrument, December 1977 or Latest Available Date 104

Table 2 - Ontario Public Sector, Average Annual Investment Yields, Selected Plans, 1972-1977 106

Chapter 5

Present and Future Cost of Public Sector Pensions

INTRODUCTION

The question of cost is central to the discussion of public sector pensions. It has less significance theoretically in the private sector because the cost of pensions is ultimately a market decision. The Commission has no particular concern that company A's pension costs 20 per cent of payroll while company B's plan costs 10 per cent of payroll. It is a matter for the employer and employees. In the public sector, however, the pension cost is of interest not only to the government as employer and its employees, but to taxpayers and the public, who ultimately pay for the pensions and so have a valid interest in determining whether such costs are reasonable or taxpayers are enriching these plans unduly.

As was noted in the chapter on Funding Principles in Volume II of the Report, funding of pension plans has two main purposes:

1. to ensure that monies will be available to pay the promised benefits at the time they become payable;

2. to ensure an orderly accrual of funds over time to effect control of the ultimate cost of the promised benefits.

For plans in the private sector the emphasis lies on the security aspect, since the continuity and financial viability of individual employers cannot be assured. In the public sector, backed by the ultimate taxing authority of the government, continuity and financial viability are reasonably certain. However government does not have the same cost strictures as the private employer who is engaged for the prime purpose of making a profit. Therefore cost control is the prime reason for funding public sector plans. Simply stated: an assessment of the

funded status of a plan tells us whether sufficient monies are in the fund to pay the benefits; an assessment of the cost tells us how much we must pay for the promised benefits and allows consideration of whether or not the promised benefits are affordable.

WHAT IS THE COST OF A PENSION PLAN?

The cost to an employer of a defined contribution (money-purchase) plan is usually an amount equal to the employees' contributions. Sometimes the employer also pays administrative expenses. Similarly, the employer's cost for a defined benefit insured plan is generally limited to the employer's share of the premiums. Difficulties in establishing cost arise primarily with the defined benefit trusteed plan.

The actual cost of a defined benefit trusteed pension plan to an employer equals the total of

benefits paid out
plus expenses incurred
less employee contributions (if any)
less investment income earned.

This cost can be determined only in retrospect, i.e., after the last beneficiary has received the last payment promised. How then can the employer know what the "cost" will be and how can that cost be identified on a present day-to-day basis? Originally when pensions were paid on a pay-as-you-go basis the cost was clearly the amount paid out in any one year. However even then, to the extent the promise bound the employer for the future, there was a need to consider what the ultimate long-term cost to the employer might be.

With the introduction of "funded" pensions, where monies were set aside before benefits were payable, costs became linked to the annual contributions which the actuary estimated were necessary to pay the promised benefits in the future. These contributions included both the cost of the current year's promised benefits and the special payments required to pay for promised benefits for past service.

R.M. Skinner describes the effect of funding requirements on accounting for pension costs:

> "The discrepancy between the results of accounting for pension costs on a pay-as-you-go basis and accounting for recognition of costs associated with advance funding hastened reconsideration of the nature of pension costs. Further impetus to reconsideration was given by cases where employers varied their contributions to pension funds from year to year in order to affect cost and income reporting. A consensus gradually developed to the effect that pension contributions were not a voluntary outlay but rather a regular

cost of doing business. Notwithstanding any legal right of the employer to discontinue the plan and limit his liability, as a practical matter an employer who wished to continue in business could not withdraw benefits once they were granted. It followed that pension costs were part of the costs of earning annual income whether or not cash was paid over to the pension plan in the year and irrespective of the amount of such payment. This then raised the question how the cost was to be measured and led to the realization that a pension plan arrangement constitutes a particularly complex form of delayed payment transaction."(1)

The pension cost accounting problem involves "estimating the ultimate costs for which the employer will become obligated under the plan formula and allocating these costs in a rational way to employees' pre-retirement years, so as to provide a fair measure of deferred wage expense year by year."(2)

The difference between cost for accounting purposes and cost for funding purposes is set out in the Accountants International Study Group Study No. 18:

"There is an important distinction between accounting for annual pension costs and funding a pension plan. Accounting for costs is related to the build-up of pension obligations during the employees' working lives, whereas funding is a matter of providing sufficient assets to discharge such obligations as they become due. In any given year the amount of pension cost may differ very substantially from the amount required by the pension plan to fund future benefit payments. However, in practice the amounts charged as pension cost frequently coincide exactly with the amounts funded, but this is not always so, because, for instance, there may be good reasons for management adopting an unusual funding policy. It is thus important to bear in mind the distinction between the two. The cost determination is concerned solely with accounting, whereas the funding is a cash flow matter."(3)

Effect of Funding Method on Cost

We saw in Volume II, Chapter 9, how the choice of funding method affects the ultimate cost of a pension. For example, in a final pay plan there are at least three valuation methods an actuary could use. While any of these three methods might be chosen by the employer, which of them - if any - would the accountant choose for reflecting cost in the employer's accounts or financial statements? The answer is that the accountant will accept any of the three that may be chosen by the employer. While accountants say...

"the accrual concept requires that current service costs for employees should be charged to income as the service giving rise to the pension entitlement is rendered, and costs for previously

unprovided past service should be charged to income over the remaining term of the employment of the relevant employees."(4)

...they have not yet decided how best to do so either in Canada or the United States. Meanwhile, by and large, they use for accounting what is used for funding.

While recognizing the need for some freedom in the choice of funding method despite the resulting variability in cost, the Commission is in agreement with the Accountants International Study Group that, in the interest of identifying cost, there should be some limitation on the number of funding methods available for use by the actuary. The Commission is recommending for all plans that a range of methods be set by the Pension Commission of Ontario, and we see no reason why public sector plans should not use any of these methods depending on their suitability. Use of the level premium method will increase annual cost initially but will result in lower annual cost later on relative to costs under an accrued benefit method, because of interest earnings on the fund.

Complete Cost Picture

Accepting this variability in cost resulting from different funding methods, we consider what must be taken into account to achieve a complete picture of the cost of a public sector plan. We require the total arising from:

1. The year's service cost which includes:

   (i) Cost of the current year's promised benefits;

   (ii) The year's share of amortized cost for experience deficiencies, that is, where actuarial forecasts and actual experience result in less money being paid into the fund in any one year than is needed to cover the cost of benefits accruing during the year; these must be spread over not more than five years;

   (iii) The year's share of amortized cost for supplemental liabilities which result from changes in the plan, e.g., where the benefit structure is improved thereby creating benefits for past service which have not been paid for by contributions in past years; these must be spread over not more than 15 years.

2. Administrative expenses.

3. Ad hoc adjustments to benefits payable to retirees which increase pension benefits but which are not funded.

4. Superannuation Adjustment Fund contributions.

Costs As Reflected in the Public Accounts

In assessing the cost of public sector plans the Commission's first undertaking was to ensure that the cost figures being given to the public for the plans were in fact correct. For this purpose it engaged a chartered accountant who was aware of the special problems inherent in pension cost accounting. In his examination the accountant took the annual pension costs to be the same as the annual amounts for funding each plan. He found that such annual costs were similar to those found in the commercial world if the same actuarial methods were used. He also found that pension costs were accounted for in the Public Accounts of the province in accordance with generally accepted accounting principles, and commented that in a number of respects the Public Accounts disclosed more complete (and understandable) information about pension costs and such matters as unfunded pension obligations than did the financial statements of some large corporations in Canada.

However, in assuming that annual cost was equal to the annual funding amount, the accountant did not examine areas which, in the opinion of the Commission, render inappropriate or incomplete the stated actual costs of the major public sector plans. The problem is primarily visible if one considers the cost calculations over a number of years. The following analysis pinpoints the problem areas and gives examples of how they have arisen in various plans. However, the major point to be made is that the whole system for identifying cost of public sector pensions is sufficiently confused that an orderly and accurate assessment of overall pension costs and of the costs of the provincial government in relation to these plans, is not readily attainable. This is not to say that the figures presented by various plans and in the public accounts are erroneous or deliberately misleading, but rather to underline the urgent need to implement a system of recognition and control of overall public sector pension costs.

Problems Areas in Overall Cost Assessment

Separation of Cost Elements

Although the elements of pension costs are to be found in the Public Accounts, they are not always put together in such a way as to give a complete cost picture. If we take the Teachers' Superannuation Fund as an example we find various problems in the cost picture. The following items of cost must be considered:

1. Current service cost is limited by the matching contribution principle. The actuary for the fund notes that the annual contributions are insufficient by .8 per cent of payroll to meet the current service cost, quite apart from the supplemental liabilities. The additional amount required is not

being paid on an annual basis but over a 15-year period, and therefore does not show the correct current service cost of providing teachers' pensions. This will be cured if the matching contribution principle is abandoned or the amount set annually.

2. Supplemental liability payments requiring annual payments of 5.1 per cent of payroll;

3. Administrative expenses for the TSF, estimated to be about $10 million in 1978-79;

4. Superannuation Adjustment Fund government contributions in 1978-79 amounted to $22.36 million.

5. Superannuation Adjustment Fund government payments for non-contributors under SABA amounted to $24.3 million for the 1978-79 year.

Thus, to get a rough but complete "cost" for the TSF for the period 1978-1979 we have:

	$ Millions
1. Current service total required cost 6.8 per cent of $2 billion	136.0
2. Supplemental liabilities 5.1 per cent of $2 billion	102.0
3. Administrative expenses	10.1
4. Superannuation Adjustment Fund government contributions	22.3
5. Superannuation Adjustment Fund government payment for non-contributors to SABA	24.3
Total employer's cost	294.7
Employer's cost as a percentage of payroll of $2 billion	14.74%

If we add to the employer's percentage employees' contributions of 7 per cent (ignoring CPP contributions up to the YMPE but including the adjustment for indexing), the total cost relative to payroll (including adjustments for indexing) is 21.74 per cent.

Total payroll for the period would be slightly in excess of $2 billion; hence the costs are slightly understated. However, it is very clear that to talk of the cost of providing pensions for teachers in

terms of 7 per cent of salary (6 per cent plus 1 per cent for SABA) from the teachers and 7 per cent from the government is to ignore over one-third of the cost.

Prepayments and other Timing Changes

Prepayments (i.e., payments in excess of those required by the funding patterns of a plan) were made by PSSF and TSF during 1976 and 1977.

A quote from the summary of the actuary's recommendations in the actuarial report dated February, 1978 for the PSSF for the period ending December 31, 1976 is informative:

1. Increase the annual interest payment on the initial unfunded liability of $82,616,000 to $5,990,000 effective January 1, 1978.

   (NOTE: A prepayment of $5,577,000 was made at March 31, 1977. This payment was invested at 9.819 per cent interest so that its value at January 1, 1978 was $5,983,000. Consequently, for this item $7,000 was due at January 1, 1978).

2. Make thirteen annual payments of $16,884,000 from January 1, 1978 to January 1, 1990 inclusive with respect to the unfunded liability of $139,136,000 related to the deficiency revealed at December 31, 1973. These are to replace the thirteen annual payments of $16,021,000 from April 1, 1977 to April 1, 1989.

   (NOTE: A prepayment of $16,021,000 was made as at March 31, 1977. This payment was invested at 9.819 per cent interest so that its value at January 1, 1978 was $17,187,000. Consequently, for this item there was an overpayment of $303,000 as at January 1, 1978).

The policy adopted by Ontario Hydro in funding certain special payments also illustrates the cost effect of a failure to adopt a consistent procedure. This failure clearly disturbs the cost perspective. In the 1976 actuarial report for the Ontario Hydro plan it was recommended that certain new experience deficiencies allowed by the Pension Benefits Act to be treated as initial unfunded liabilities, be amortized over 15 years. The same liability was noted in the 1977 actuarial report to be amortized over 5 years.

> "In the cost certificate enclosed with the December 31, 1976 valuation, this experience deficiency was shown to be amortized over 15 years. Ontario Hydro was subsequently advised by their auditors to amortize it over 5 years."

In the 1978 actuarial report the same liabilities were again to be amortized over the remainder of the original 15-year period.

It should also be noted that, although a special payment of $10,472,000 for post-retirement adjustments to pensions required an additional annual payment of $1,047,000 for 15 years to be made, "no contribution was made on this account in 1977, so that in 1978 an additional payment of $1,047,000 plus interest is required, making a total of $1,110,000." (Hydro actuarial report for the period ending December 31, 1977).

Both prepayments and alterations in the timing of payments, while permissible and possibly advantageous in private sector plans, in public sector plans only serve to distort the true cost picture if cost is to be allocated in an orderly way over the employee's worklife (subject to amortization periods). We do not see the same need for the government as for business to increase special payments from time to time to reflect tax advantages or special cash flow situations. The Commission recommends that government policy embody the principle of orderly funding of pension plans to the full extent allowed by the Pension Benefits Act. In this way, distortions of cost resulting from over-payment, under-payment, or alterations in the timing of payment can be avoided.

Accumulation of Surplus

Over the period from 1970 to 1978 the Workmen's Compensation Board plan has been in a surplus position and that surplus has been increasing. At the end of the last actuarial valuation (December 31, 1977) the surplus stood at just over $13 million, having increased from $1.4 million at the end of 1970. No adjustment has been made to decrease proportionately the employer's contribution rate.

At the end of December, 1970, OMERS had a surplus of $23.2 million which continued to build to a high of $72 million at the end of December, 1974, falling to $60 million at the end of 1976. As of January 1, 1978 the OMERS basic plan switched to a final average formula, and the plan is no longer in a surplus position.

To allow a plan to reach a surplus position and then continue the building of such surplus is not, in the opinion of the Commission, a proper allocation of funds for a public sector plan; it results in a distortion of overall pension costs. If such a build-up of surplus is an invitation for improved benefits, those responsible for the plan decisions should not encourage this form of pressure. There is provision under the Pension Benefits Act to apply for a refund of surplus to the employer. In the case of the WCB, the Commission recommends that such an application be made immediately and the refund applied to the current service costs of the plan, which are paid for by employer premiums and represent a cost of doing business which in turn is reflected in the price to the consumer. No public sector pension plan should

normally continue in a surplus position for more than one valuation period.

Timing of Actuarial Valuations

The Commission has found it impossible to get an overall picture of the cost of public sector plans which can be relied on with any degree of assurance. The chief reason for this is timing: each plan may have a plan year other than the calendar year; and various plans may be on different cycles for triennial actuarial valuation reports. Table 4 below illustrates how difficult it would be to make any reliable comparisons or obtain any reliable total cost figures in these circumstances.

Timing of Fiscal Periods and the Public Accounts

The public accounts for the province are prepared for a fiscal year ending March 31. Many pension plans have a December 31 year end. Consequently, the pension costs reflected in the public accounts will not necessarily coincide with those in the pension plan statements. The degree of complexity may be illustrated in attempting to ascertain precise costs for the TSF. We have already noted how the elements of cost are scattered throughout the public accounts. In addition, the various cost elements are likely to be stated for different periods.

The Teachers' Superannuation Act provides:

> 22.(1) Annually and at the same time as the total legislative grant is payable to the board or other authority, the Treasurer shall place to the credit of the Fund a sum equal to the contributions made by or on behalf of the persons to whom this Act or the regulations apply.
>
> 23. All sums placed to the credit of the Fund during a fiscal year under section 22 shall be deemed to have been credited as of the 1st day of June in the preceding fiscal year, and the Treasurer shall pay interest thereon for the period between that day and the last day of the fiscal year in which the sums were actually received.

Thus the government's matching contributions are made under section 22 at December 31 of the year <u>following</u> the year in which employees' contributions have been made; but by virtue of section 23 the government payments are <u>deemed</u> to have been made at June 1 of the year in which the employees' contributions were made. Because of the actual postponement in payment there is also an interest payment for 19 months at the time the government's contribution is actually paid. This interest is at the rate of 6 per cent and not at the rate for the non-marketable debentures. Because of these fiscal arrangements the true asset position of the plan at the date for the actuarial valuation report is unlikely to be disclosed.

Further, since the TSF operates on a calendar year basis and the government payments to the TSF are made on that basis, though reported on a fiscal year basis in the Public Accounts, the expression of total expenditures by the government on the TSF as a percentage of members' pensionable earnings in a fiscal year would also be distorted if these percentages were compared with percentages for other plans.

It is clear that a number of difficulties have arisen with the increasing complexity of government accounting; but some changes are absolutely necessary if there is to be any hope of identifying the cost of pension plans in the public sector.

Cost of Supplemental Liabilities

Supplemental liabilities, which include both experience deficiencies and initial unfunded liabilities, can arise for several reasons. In considering their cost and how the cost may be controlled, it is important to identify the cause of such supplemental liabilities. They can arise in two general ways: first, from actuarial losses - that is, differences between plan experience and the actuary's forecasts; and second, from changes in the terms and conditions of the plan.

Actuarial Losses

Where actuarial forecasts are not borne out by actual experience, the difference may be caused by changes in the funding method, changes in the actuarial assumptions, or variance of actual experience from the assumptions made and the projections based on them. The Commission urges a more stringent control of the actuarial element, both by requiring more frequent actuarial valuations with contemporaneous adjustment of the contributions required to fund any supplemental liabilities, and a move toward more realism in those assumptions where practicable. These controls are discussed in the section on cost control. Some supplemental liabilities from the actuarial element are inevitable, but they can also be limited.

The TSF experience is a good illustration of the difficulty of accurate forecasting. The unfunded actuarial liability of the TSF between the actuarial valuations for the periods ending December 31, 1972 and December 31, 1975 increased by $800 million. The bulk of this increase arose from the unexpected size of salary increases during the three-year period. Annual actuarial valuations would have revealed the effect of the salary increases and allowed adjustment in estimates for both current service and special payments. Even though the matching contribution principle would have prevented any adjustment in the payments there would have been awareness of the problem much sooner and, one would hope, corrective action.

Plan Improvements

When a plan is amended so as to improve past service benefits (benefits relating to any service of employees before the date of the amendment), an initial unfunded liability is created. The cost of any improvement for both past and future service is calculated by the actuary and special payments set up for amortizing the unfunded liability over not more than 15 years. Accountants accept the special payment as the annual cost of the benefit; the Commission is prepared to accept this as the true cost of the benefit provided the actuarial estimate has been done with sufficient conservatism. Problems have arisen in the costing of early retirement provisions and indexing. These problems stem from incorrect forecasts of utilization rates in the cost of early retirement, and inflation rates in the cost of indexing. Costing must be done with great care to ensure that those who will receive the benefit will be responsible for a fair share of its cost, both through the employee's own contributions and through the employer contributions attributable to that employee, which in turn are reflected in cost as a percentage of payroll.

Early retirement privileges without actuarial reduction provide an example of how costs may be obscured. These provisions are usually referred to as "early retirement" but in some plans they are part of the retirement age structure and in that sense are not early. The PSSF allows normal retirement before age 65: at age 60 with 20 years' service or when age and service total 90. We have retained the use of "early" for these provisions in the discussion that follows.

Such provisions create a very significant retirement subsidy and a substantial but well-concealed "bridge" benefit. This is so because pension plans providing benefits based on final average earnings generally expect to gain some relief from the "strain" of financing early retirement because the actual pension is based on current earnings as opposed to projected earnings. This is a consequence of the funding mechanism and tends to conceal the "true" cost of early retirement.

For example, suppose a member may expect to have average earnings of $15,000 between ages 55 and 60 and $19,000 between 60 and 65. At age 60 the plan will hold an actuarial reserve based on a projected salary of $19,000 and service to age 60. If the member retires at age 60, the conversion to an immediate pension based on $15,000 imposes less financial strain on the fund than would be the case if the original actuarial reserve at age 60 for the deferred pension was only based on $15,000. Moreover the member retiring at age 60 has five years less service than if he stayed to age 65, unless the 35-year maximum on credited service applies.

Early retirement therefore affects the pension cost in the following ways:

- the pension is based on a lower salary average;

- the years of credited service are reduced;

- the pension is paid for a longer period;

- the interest earnings are reduced because the pension commences earlier;

- the contribution income is reduced.

Although the pension amount is lower on early retirement, the cost to the employer is greater. In addition, public service pensions are indexed for inflation (to a maximum of 8 per cent per annum). This greatly adds to the value of the early retirement pension, makes early retirement much more attractive to employees, and magnifies the employer's cost.

In addition, integration with the CPP benefit does not come into effect until the employee reaches age 65. Therefore the early retirement pension consists of a pension for life plus a temporary annuity to age 65, that is a "bridge" benefit equal to the CPP benefit at age 65.

Even a member who does not qualify for an unreduced pension receives a subsidy on early retirement. This may be illustrated by an examination of the 5 per cent annual reduction available to employees who retire after age 55 but who do not satisfy the 60 and 20 requirement or the rule of 90. The reduction is sometimes described as a "penalty," but in fact it represents a major benefit.

Let us compare the early retirement pension with the value of a pension commencing at age 65.

Table 1
Early Retirement Pensions, Value at Various Ages of Commencement with and without Subsidy

(1)	(2)	(3)	(4)
Age	No subsidy i.e., market value equivalent	Subsidized early retirement (5% p.a.)	Ratio of (3):(2)
	(Per cent)	(Per cent)	(Per cent)
65	100.00	100.00	100
62	76.49	85.00	111
60	64.28	75.00	117
55	42.24	50.00	118

Column (2) in Table 1 was determined using the GA-1971 Mortality Table and 7.25 per cent interest, assuming no indexing and a pre-retirement death benefit at the actuarial equivalent of the benefits involved.

If the early retirement pension were unreduced, we would merely substitute 100 per cent for all figures in column 3. This calculation would demonstrate the large subsidy involved in unreduced early retirement at younger ages.

Thus we see that the true cost must be very carefully assessed, and that costing of proposed benefits before they are introduced to reveal the full cost is essential. Otherwise the true cost will only reveal itself later in the increased size of supplemental liabilities.

Distortion of costs for the situations mentioned above may be present from time to time in any or all of the defined benefit plans in the public sector. Before considering recommendations for cost control which will entail removing some of the distortion and keeping in mind the tentativeness of the figures, we address the magnitude of costs in the major public sector plans.

MAGNITUDE OF COSTS AND LIABILITIES

Some consideration of the present cost figures for public sector plans will illustrate the enormous size of some of the plans, their annual cost and their unfunded actuarial liabilities which still are to be paid for in the future. For the purposes of this discussion we concentrate on PSSF, TSF, OMERS, HOOPP, Hydro, and Workmen's Compensation Board (WCB).

To deal with assets, actuarial liabilities, and unfunded actuarial liabilities, Table 2 was prepared from the actuarial reports for these plans for the period from 1969 to the latest ones filed with the Pension Commission of Ontario as of the fall of 1980. The most recent report studied was that of Hydro for the period ending December 31, 1979. However, the actuarial valuations using the level premium, entry age normal method of funding (PSSF, TSF and WCB) included the present value of future contributions from employers and employees in the total value of the assets. Table 3 was therefore prepared to eliminate these future contributions from both the asset and actuarial liability figures for these plans so that we could deal with more tangible values.

(In preparing Table 3, it was also recognized that some of the assets are valued at more than their present market value - with a correspondingly higher figure for actuarial liability - because of the practice of capitalizing interest which is in excess of that based on the actuarially assumed rate. (See Volume II, Chapter 9). It was not felt necessary to adjust for this difference for the purposes of

Table 3; but it should be noted that in the TSF, for example, such an adjustment would result in figures at December 31, 1978 of $3.2 billion for assets and $4.3 billion for the actuarial liability).

The information in Table 3 may be analyzed in several ways. First, there is the picture in absolute dollars. We see, for example, that in less than ten years the TSF assets had grown from $727 million to $4.5 billion. The total combined assets of these six plans for various periods, with the latest being December 31, 1979, was nearly $9 billion.

Secondly, one can apply these total assets against a total actuarial liability of $10.6 billion and arrive at a total unfunded actuarial liability of close to $1.7 billion. The unfunded actuarial liability amounted to 16 per cent of total actuarial liability; that is, the overall proportion funded was 84 per cent. Totals, however, in this respect are misleading, and one must examine the figures for the various plans to assess how well they were funded.

More significant is the change in the funded position over the period. For example, the PSSF had an unfunded actuarial liability which was 21.8 per cent of actuarial liability at December 31, 1970. By December 31, 1976 it had risen to 32.1 per cent, indicating that the funded position of the plan had deteriorated. At the other extreme, Hydro had an unfunded actuarial liability at December 31, 1970 of $31.9 million, or 8.9 per cent of the actuarial liability, but by December 31, 1979 it had a surplus of $80.8 million, or 6.7 per cent of the actuarial liability.

Since 1976 other costs and liabilities have been building as a result of indexing of the PSSF and the TSF plans. These costs are not reflected in the unfunded actuarial liabilities shown in Tables 2 and 3.

Of particular interest in the quest for cost control is the latter part of the table which ages the information available. Obviously there is no uniform period on which the plans may be compared properly, and no basis for obtaining an overall picture of the cost position of the plans either in absolute dollars or in growth trends.

The plans may also be assessed by considering the cost to the employer as a percentage of payroll. Results of this method are also subject to reservations as to accuracy. However an assessment was undertaken and the results appear in the public sector study data (Volume VII, Tables 8.1 to 8.5). These tables show public sector employer payments as a percentage of pensionable payroll over a period from 1971 to 1977. The costs reflect all the costs, as in our example for the TSF, except administrative expenses.

Table 2
Six Public Sector Pension Plans in Ontario, Assets, Actuarial Liabilities, Unfunded Actuarial Liabilities

	Valuation date	Actuarial funding method	Assets	Actuarial liability	Unfunded actuarial liability or (surplus) Amount	Unfunded actuarial liability or (surplus) Per cent of actuarial liability	Years elapsed from pre-1971 to latest valuation	Years elapsed since latest valuation
			(Thousands of dollars)					
Last Actuarial Valuation Pre-1971								
PSSF	Dec. 31, 1970	Level premium entry age normal	861,044	978,285	117,241	12.0		
TSF	Dec. 31, 1969	"	1,758,763	2,141,028	382,265	17.8		
OMERS	Dec. 31, 1970	Accrued benefit unprojected	204,423	181,166	(23,257)	(12.8)		
HOOPP	Dec. 31, 1970	Accrued benefit projected	135,772	149,103	13,331	8.9		
Hydro	Dec. 31, 1970	"	336,842	368,750	31,908	8.6		
WCB	Jan. 1, 1971	Level premium entry age normal	50,772	49,339	(1,433)	(2.9)		
Net combined			3,347,616	3,867,671	520,055	13.4		

(continued...)

Table 2 (continued)
Six Public Sector Pension Plans in Ontario, Assets, Actuarial Liabilities, Unfunded Actuarial Liabilities

	Valuation date	Actuarial funding method	Assets	Actuarial liability	Unfunded actuarial liability or (surplus) Amount	Per cent of actuarial liability	Years elapsed from pre-1971 to latest valuation	Years elapsed since latest valuation
					(Thousands of dollars)			
Latest Actuarial Valuation Filed with the Pension Commission of Ontario as of Fall of 1980								
PSSF	Dec. 31, 1976	Level premium entry age normal	2,112,406	2,617,761	505,355	19.3	6	3
TSF	Dec. 31, 1978	"	9,006,181	10,102,278	1,096,097	10.8	9	1
OMERS	Jan. 1, 1978	Accrued benefit projected	1,205,495	1,320,658	115,163	8.7	7	2
HOOPP	Dec. 31, 1978	"	757,518	831,389	73,871	8.9	8	1
Hydro	Dec. 31, 1979	"	1,289,787	1,209,023	(80,764)	(6.7)	9	-
WCB	Dec. 31, 1977	Level premium entry age normal	111,656	98,632	(13,024)	(13.2)	7	2
Net combined			14,483,043	16,179,741	1,696,698	10.5		

Source Royal Commission on the Status of Pensions in Ontario.

Table 3
Restated Assets, Actuarial Liabilities, Unfunded Actuarial Liabilities of Six Public Sector Pension Plans in Ontario

	Valuation date	Actuarial funding method	Assets	Actuarial liability	Unfunded actuarial liability or (surplus) Amount	Unfunded actuarial liability or (surplus) Per cent of actuarial liability	Years elapsed from pre-1971 to latest valuation	Years elapsed since latest valuation
			(Thousands of dollars)					
Last Actuarial Valuation Pre-1971								
PSSF	Dec. 31, 1970	Level premium entry age normal	421,266(a)	538,507(a)	117,241	21.8		
TSF	Dec. 31, 1969	"	727,079(a)	1,109,344(a)	382,265	34.5		
OMERS	Dec. 31, 1970	Accrued benefit unprojected	204,423	181,166	(23,257)	(12.8)		
HOOPP	Dec. 31, 1970	Accrued benefit projected	135,772	149,103	13,331	8.9		
Hydro	Dec. 31, 1970	"	336,842	368,750	31,908	8.6		
WCB	Jan. 1, 1971	Level premium entry age normal	32,900(a)	31,467(a)	(1,433)	(4.6)		
Net combined			1,858,282	2,378,337	520,055	21.9		

(continued...)

a Adjusted by eliminating the present value of future contributions by employer and employees.

Table 3 (continued)
Restated Assets, Actuarial Liabilities, Unfunded Actuarial Liabilities of Six Public Sector Pension Plans in Ontario

	Valuation date	Actuarial funding method	Assets	Actuarial liability	Unfunded actuarial liability or (surplus)		Years elapsed from pre-1971 to latest valuation	Years elapsed since latest valuation
					Amount	Per cent of actuarial liability		
			(Thousands of dollars)					
Latest Actuarial Valuation Filed with the Pension Commission of Ontario as of Fall of 1980								
PSSF	Dec. 31, 1976	Level premium entry age normal	1,070,166(a)	1,575,521(a)	505,355	32.1	6	3
TSF	Dec. 31, 1978	"	4,536,531(a)	5,632,628(a)	1,096,097	19.4	9	1
OMERS	Jan. 1, 1978	Accrued benefit unprojected	1,205,495	1,320,658	115,163	8.7	7	2
HOOPP	Dec. 31, 1978	Accrued benefit projected	757,518	831,389	73,871	8.9	8	1
Hydro	Dec. 31, 1979	"	1,289,787	1,209,023	(80,764)	(6.7)	9	-
WCB	Dec. 31, 1977	Level premium entry age normal	73,520(a)	60,496(a)	(13,024)	(21.5)	7	2
Net combined			8,933,017	10,629,715	1,696,698	16.0		

a Adjusted by eliminating the present value of future contributions by employer and employees.

Source Royal Commission on the Status of Pensions in Ontario.

In 1977 pension payments made by government as the employer's share of cost ranged from .5 per cent of payroll in the Ontario Milk Marketing Plan to a high of 26.48 per cent for the City of Toronto Civic Employees. The Ontario Hydro Pension Plan cost was 15.48 per cent, Teachers' Superannuation (TSF) 13.75 per cent, and Public Service Superannuation (PSSF) 9.94 per cent of payroll for the same year. However when we consider the effect of the funding method chosen we realize that the percentages themselves, for comparative purposes among plans are not very useful for those plans using an accrued benefit method since a determining factor is the point of progress through the funding period. For level premium funding, theoretically, the percentage will be constant and could be more informative for actual pension costs. Both methods, however, are affected in reality by the size of experience deficiencies and other supplemental liabilities which are being paid off over different periods, thus obscuring the direct effect of method on cost for the actual plans.

The percentages in general do show a general rise from those in 1971 to those in 1977. The reasons for the changes could be several, with one or more applicable to each plan. These could be: a change in funding method; a change in actuarial assumptions; improvements in benefit structure or plan features; or changes in amounts or timing of payments to reduce unfunded liabilities.

What is important is that there is a distinct and marked trend towards increased cost as a percentage of payroll and increased unfunded actuarial liabilities. Our investigations have convinced us that not enough control is being exerted over these costs and that it is imperative that an improved cost control system be adopted now.

COMPARISON WITH THE PRIVATE SECTOR

The Commission was specifically charged to study the interrelationship between private sector plans and public employee pension plans. In his statement to the Legislature on establishing this Commission, the Premier referred to the conspicuous fully-indexed benefits of public employee pension plans. This feature like no other has reinforced the public's impression of a privileged position for public sector employees vis-à-vis other employees. The public has been vocal on this divisive issue, and submissions to the Commission raised this matter and drew comparisons with the private sector.

Dominion Foundries and Steel Limited, Brief 129:

> "When Ottawa or any other level of government pays a wage rate or offers a benefit which is significantly greater than what is considered the norm in the private sector, the labour force in the private sector will quite correctly strive to obtain that higher wage level or better benefit. Problems arise when the private

sector cannot afford to follow the lead of government....The question really becomes not whether government can afford to fund the indexing of pensions for its work force, but becomes a question of whether the private sector can."

Mr. Robert E. Costello, Brief 37:

"I am 100 per cent against the indexed pensions now being paid to Federal Government MPs and civil service. They are not fully funded and place a burden on the taxpayer who quite often has little or no pension benefits....Industry pension plans cannot compete with those offered by Federal or Ontario governments and I see no reason why the governments should lead in this area - they tend to lag in other areas, i.e., productivity, efficiency, control of spending, etc."

United Church of Canada, Brief 206:

"...we believe that a common basis could be found in the proposition that no one sector of employees seeks, nor should be granted, an advantage not available to another sector. Further, since it has been generally agreed that fiscal policy is one of the factors influencing the rate of inflation it should be questioned whether it is desirable in principle to insulate those policy makers from the possible adverse consequences of their decisions." (p.21)

Southam Press Limited, Brief 251:

"A point of concern to us at this time is the disparity between benefits under our final-average plan and those of many public service plans, including their indexing. It disturbs our employees. And it disturbs management for two reasons.

"The first is the impracticality of our being able to follow suit. Our final-average plan is reasonable and we would like to be able to upgrade gradually, but not to what appears an unnecessary level.

"The second reason concerns that level. We cannot see the rationale for public service pensions that provide for full-service individuals at age 65 a post-retirement net income, indexed, that is over 91 per cent of pre-retirement net income at the $10,000 per year gross pay level, and not less than 80 per cent of pre-retirement net income for gross levels up to $35,000 per year. This arises as a result of the cessation of retirement plan, CPP/QPP and UIC contributions coupled with CPP/QPP and OAS payments plus tax benefits for those aged 65 and over." (pp. 1-2)

Ontario Hydro, Brief 299:

> "The environment in which business and industry are forced to operate is quite different from government in that private sector enterprises are expected to cover all costs, including actuarially determined pension liabilities. However, it is the private sector in which productivity gains have to be made.
>
> "Employees in private organizations want pensions equivalent to those already made available to many public servants. Consequently, incompatibility between government and private sector pensions generates tensions.
>
> "It is therefore recommended that...pension plans for government employees be reasonably comparable with private plans." (pp. 1-2)

Algoma Steel, Brief 218:

> "Governments, as an employer, must be responsible employers. They must also respect the rules which apply to the private sector in their dealings with their employees. As an employer, government should not set standards beyond those which are reasonable." (p.28)

The Commission believes that government must take notice of these strong public statements concerning differences between public and private employee benefits, especially in the pension area. The general evidence supports the contention that public sector employees are better off in terms of pension benefits than are private sector employees. Coverage is higher in the public sector - 94.8 per cent compared with 39.1 per cent. Plan benefits are generally higher in the public sector. Almost 96 per cent of plan members in the public sector are in a final earnings plan compared with 31 per cent in the private sector. About 83 per cent have survivor benefits compared with 21 per cent in the private sector and 81 per cent have a full accrued disability benefit in the plan compared with 28 per cent of private sector members. Almost no members in the private sector have automatic adjustment for inflation (95.2 per cent) while almost 60 per cent of members in the public sector have some automatic protection. A good measure of portability exists within the public sector through reciprocal transfer agreements, which are virtually non-existent in the private sector. Public sector plans permit a wide variety of relief from the continuous service requirement. Past service options which take into account military service are widespread. Contributions may be made while receiving Workmen's Compensation benefits.

The cost of pensions is inevitably affected by their generosity. It is cost which must be the limiting factor in assessing public sector benefits. In the Commission's opinion, the taxpayer must not be obliged to shoulder the cost of pension benefits for public sector employees

at a level they cannot hope to gain for themselves because of cost limitations in the private sector.

The Commission therefore recommends that:

The Government of Ontario seek to achieve parity with the private sector in total compensation of its employees, and in particular should not provide pension benefits more generous than those generally available in the private sector, measured by the full and true cost of such benefits. The government should not lead the way for the private sector, particularly in the areas of inflation adjustment and early retirement without actuarial reduction.

Does the Public Sector in Fact Lead?

We have made the point that government is not subject to the same cost constraints as the employer in the private sector who must make a profit to survive and who must constantly seek to control costs. Government has other factors which force it to control costs but these are less immediate. It also is in a different position from the private employer when it sits down at the bargaining table to settle employee benefit structures.

For many years, the conventional wisdom was that public servants, although lower paid than workers in the private sector, had better pension benefits to compensate. The general comparative evidence given for the availability of desirable benefits raises doubt about the continuing validity of that assumption. The difficulty of assessing whether or not public and private sectors in fact have a rough parity in employment benefits is that of establishing a measure for comparison. The problem arises not only between the public and private sectors but within each of the sectors themselves. For example, would one seek to compare a private sector plan with the PSSF or with the WCB or the Queen's University plan? Would one compare a public sector plan with the plan of Shell Oil, Algoma Steel, Eaton's, or that of an employer of 50 people? If one decides to compare the PSSF and Algoma Steel, then what constitutes total compensation for purposes of comparability - salaries, pensions, group insurance, sick leave benefits, subsidized lunches, working hours, etc.?

This Commission was in no position to begin to assess total compensation. Even looking at pensions alone, comparisons are exceedingly difficult. At least three approaches are possible. The first is to compare benefits paid out at any point in time to employees with the same salary, age, and service characteristics on the basis of the employer's cost of providing such benefits. A survey was undertaken several years ago comparing PSSF pensions with those of twelve large employers in the private sector. Benefits were compared on the basis of the basic pension each employee would have received from the employer's contribution for service with the PSSF and with each of the companies

compared. Costs as a percentage of payroll were also compared. In the result, the PSSF ranked in the top one-third of the companies surveyed for basic pension benefits, pension costs as a percentage of payroll, inflation adjustments, and survivor benefits. PSSF was at or near the top for early retirement benefits. Fifty per cent of the private companies also had savings plans with employer contributions, while the the Government of Ontario had no such arrangements for its employees.

The PSSF total pension cost as a percentage of payroll was shown as 13 per cent. Two of the private plans had percentages slightly in excess of this, but in only one did the employee's cost as a percentage of payroll exceed that of the PSSF. While the comparison indicates that the PSSF is in the top range of large employers in pension benefits, the comparison is not conclusive.

A second approach is to value the pension benefit on the basis of what it would cost the government as employer to provide a benefit similar to that provided in the private sector. This approach is referred to as the "level of compensation method" in the Tomenson-Alexander report on the Federal Public Service pension plan.

> "Under this method one assumes the characteristics of the Federal Public Service - such as age, sex, years of service and turnover experience - and determines the total value of that benefit program if it were adopted by the Federal Public Service. From this total value would be deducted the employee contributions in order to determine the net value of the plan to the employees."(5)

It is argued that this approach is to be preferred over the first one because the employer's cost as a percentage of payroll in the former approach reflects the funding pattern, partly in the method of funding and partly in the time for amortization of unfunded liabilities. Variations in contribution rates would invalidate the comparison of values with those in the private sector.

A third approach is an overall assessment of the features included in a plan from a "cost rating" viewpoint. Does a plan include features which are known to be costly? Features which are expensive will not commonly appear in most plans. One need only look at the various tables in Pension Plans in Canada 1978 (Statistics Canada) to observe that most plans will not include some or all of: a final average formula; indexation, full or partial; early retirement without actuarial reduction; survivor benefits; reciprocal transfer rights.

However, if we then examine the five major public sector plans and the WCB plan we find:

- all have a final or best average formula;

- OMERS and HOOPP do not provide some indexing of benefits after retirement; Hydro has ad hoc adjustments on a regular basis;

- only OMERS does not have unreduced early retirement, except in supplementary plans;

- all provide for a 50 per cent widow's pension on death after retirement

- all have some reciprocal transfer rights.

From the foregoing it appears that these public sector plans are above average in providing desirable plan features. It can therefore be argued that these plans must be more costly than average plans in the private sector. While this approach is useful, it must also be remembered that employee contributions may also be higher than average; the employees argue that they are in fact paying for the desirable benefits.

PSSF and TSF members pay 7 per cent of salary (6 per cent plus 1 per cent for indexing); OMERS, 7 per cent; HOOPP and WCB, 6 per cent; Hydro, 5 per cent (all with some type of CPP integration in the contribution formula).

The question therefore is whether the additional contribution above what is considered average is sufficient in relation to the above-average cost. We have already noted that the 1 per cent contribution to SABA is not sufficient to fund the indexing of retirement benefits for the PSSF and the TSF.

Comparisons by per cent of payroll costs with the private sector may also be helpful in considering the plan feature cost rating. The Financial Executive Institute Canada Report on Survey of Pension Plans in Canada, March 1980, reveals an average employee contribution rate of 4.2 per cent of salary. The cost to the employers in the sample is shown in the following table taken from the report:

Table 4
Total Annual Pension Costs to Selected Employers Including Past Service Cost and Experience Deficiency Write-Off as Percentage of Salary and Wages, Canada

	Fiscal years							
	Estimated current		Actual latest		Actual previous		Actual 1974	
		(%)		(%)		(%)		(%)
Under 5%	32	16.7	41	18.9	44	20.3	44	25.2
5% to 7.4%	52	27.2	52	24.2	51	23.6	50	28.5
7.5% to 9.9%	52	27.2	58	27.0	59	27.4	36	20.6
Over 10%	55	28.9	64	29.9	62	28.7	45	25.7
	191	100.0	215	100.0	216	100.0	175	100.0
Not given	57		33		32		73	
Total	248		248		248		248	
Average cost	9.4%		9.9%		9.4%		8.1%	

Source FEI Canada, Report on Survey of Pension Plans in Canada, March 1980, Table 10.

The FEI study canvassed 205 corporations with total net capital of $227.8 billion, sponsoring 248 pension plans. These represent larger employers so that averages are for this group and are not diluted by costs for small employers.

Again recognizing the problems of direct comparability, we refer to the public sector study data on employer's cost as a percentage of payroll for public sector plans (see Tables 8.1-8.10 of the study in Volume VII). FEI data are for the fiscal year 1978; the public sector study data are for 1977.

Table 5
Employer's Payments into Pension Plan as a Percentage of Pension Payroll, 1977 - Six Plans, Ontario Public Sector

	Per cent
PSSF	9.94(a)
TSF	13.75(a)
OMERS	(b)
HOOPP	7.69
Hydro	15.48
WCB	9.05

a Includes 1 per cent contribution under SABA.
b Not available for 1977.

If we then add the average employee's contribution to the FEI results and the actual employee's contribution to the public sector plans we find total cost percentages as follows:

Table 6
Total Payments into Pension Plan as a Percentage of Pensionable Payroll - Six Plans, Ontario Public Sector and FEI Study Average

	Per cent
PSSF (1977)	16.94
TSF (1977)	20.75
HOOPP (1977)	13.69
Hydro (1977)	20.48
WCB (1977)	15.05
FEI (1978)	14.1

Despite the difficulties in comparing the data, the Commission finds from this cost rating a clear inference that the public sector is providing better benefits than many private sector plans of larger employers and is also paying a higher percentage of payroll to provide pension benefits.

Whether the government is leading the private sector in total compensation is beyond the competence of this Commission to assess, but for pension cost alone the Commission finds the demonstrated difference disturbing. The Commission is of the opinion that more effective cost assessment and control is needed for public sector plans.

EFFECTIVE COST CONTROL

The public sector has 127 pension plans, almost none of which comes under direct government control. Interposed between the government and employees are employers such as school boards, municipalities, and hospitals. Each of these employers may come under a particular ministry of the government or may be a Crown corporation or agency such as Hydro. Pensions form only one part of an employment benefits package which has to be settled with the employees, whether informally or through formal bargaining with a union. To bring some consistency and order into the current situation and so permit cost control is a major problem for the public sector.

It was suggested to the Commission that there be some attempt to standardize pension benefits for all public sector employees by combining all pension provisions into a single plan which could be operated by one pension board or ministry. The Commission rejected such a possibility on the ground that the disruption created would be impos-

sible to cope with on a defined benefit basis without many arbitrary decisions which would have to be forced on employees. The various pension plans have grown and adapted to the particular work-forces which they serve, and this should continue until some better method can be instituted for assessing pension comparability.

The financing structures of the various employers are also very diverse, reflecting the policies of different ministries within the government. A consistent policy might be achieved by putting all pension benefits under a pension board or ministry; but the Commission also rejects this approach because pensions are only one element of employees' compensation and should not be administered separately from the other elements.

In the Commission's opinion, diversity in pension benefits in the 127 plans should be permitted to continue, but steps must be taken to isolate and control the cost of the plans. The present government structure requires cost control through approval of the estimates of government ministries and agencies by the Legislature, and of bodies at the municipal level by the taxpayers. The weakness in cost control is that pension costs are not always identified and are not always stated as a total cost.

We have seen how the total cost of a plan can be obscured by the matching contribution principle, by failure to isolate the complete cost of all benefits and by failure to attribute all elements of pension cost to the particular employer.

The practices of the six plans we have used in previous examples indicate the difficulties in isolating and charging pension costs in a way that lends itself to control.

For the PSSF, compensation costs (salaries, pensions, and other benefits) are charged directly to the appropriate ministry or agency of government. The charge for pensions includes current contributions as well as payments toward deficiencies. (Previously deficiencies were paid centrally and charged to the Ministry of Government Services).

For the TSF, contributions by the government to the pension fund are charged to the Ministry of Education. While these amounts are looked upon by the Ministry of Education as part of the total spending by government on education (within the terms of the "Edmonton Agreement"), there is no specific or direct charge to school boards. Except for some separate school boards, the local boards have no knowledge of or responsibility for their share of the cost of the teachers' pension plan. Even where these separate school boards have pension charges, the charge is for current contributions only and not for special payments to amortize deficiencies. The Commission favours steps that recognize these pension costs as part of the specific amounts charged to individual school boards.

For OMERS, the cost of the basic plan is determined by the OMERS board and a set percentage of payroll is charged to each member municipality. These pension costs then are borne by the individual municipalities directly and they appear as expenditures which must be financed out of provincial grants and municipal tax levies. Pension costs are not a specific item in municipal grants from the provincial government; they are covered by the unconditional grants. Three or four supplemental programs for municipal workers are also administered by OMERS. These are at the option of the individual municipality, and the employer's share of the cost is borne entirely by the municipality. For these plans OMERS develops individual operational experience and costs for individual municipalities so that each municipality in fact pays its own cost.

For HOOPP, costs are fixed and charged to member hospitals in much the same way as OMERS. Pension costs are part of the hospital budgets submitted to the Ministry of Health.

For Hydro, pension costs are charged directly to the corporation's own accounts, and therefore are to be recovered out of utility rates charged to the public.

For the WCB, pension costs are charged directly in its own accounts. These costs then affect the rates charged to employers for Workmen's Compensation coverage.

Cost Control Responsibility

In considering the variety in methods of charging pension costs, the Commission concluded that a number of steps should be taken to ensure effective cost control. These involve three areas on which the Commission has developed recommendations. These areas are:

1. Determination of total cost of pension;

2. Disclosure of total cost;

3. Assessment of total cost.

There must, however, be one body responsible for applying the instruments of cost control. In the Commission's opinion, this jurisdiction should be assumed directly by Management Board of Cabinet, as the agency which has the closest responsibility for controlling government spending in its broadest sense. Unless control is exercised at this level, pension plan costs can quickly get out of hand in the total cost context. (The TSF offers a sobering example of how cost impact can be lost through divided responsibility. While local school boards have the responsibility to negotiate and pay teachers' salaries, pension costs - which are affected directly by increased salaries - are paid for by the Ministry of Education, which has no control over

salaries). Management Board is in the best position to assume overall control of pension costs.

Management Board should be assisted in its responsibility by the Treasury which has the expertise to make independent cost determinations to ensure that the true cost picture is available. The Commission therefore recommends:

1. That responsibility for cost control of all public sector pension plans be placed with Management Board of Cabinet, with power to scrutinize the operation of each plan and to control the cost and obligations of each plan through budgetary control of the plan sponsor.

2. To assist Management Board in its responsibility, Treasury assume four independent responsibilities relating to public sector pension plans:

   (i) to set the inflation factor for use in determining salary scales and interest rates as required for actuarial valuations of public sector plans;

   (ii) to scrutinize and evaluate from a true and total cost perspective the actual operating experience of each public sector pension plan and to report its findings to Management Board;

   (iii) to evaluate the true and total cost of proposals for change in each plan and determine the contribution rates for both employees and employer to pay the full cost of such changes, (all proposals to be submitted through Management Board to Treasury for costing before any such change is made), and to report its findings to Management Board; such findings shall also be available to the public upon request;

   (iv) to report periodically to the public on the operation of public sector pension plans and in particular the cost of the plans in dollars and as a percentage of payroll and the cost-sharing between employer and employee; such report to be made annually for the PSSF, TSF, Hydro, HOOPP, OMERS, and WCB, and at least every six years for all other public sector pension plans.

Fixing the Inflation Assumption

Variance in the inflation factor used for setting interest rate and salary scale assumptions in the past has been commented on in Chapter 3. The need for some consistency throughout the public sector plan valuations is patent. In the Commission's opinion, the Treasurer is in

the best position to set the inflation factor annually so that the same factor will be utilized by all the plan actuaries. It should be stressed that the Commission is not recommending a fixed interest rate or salary scale. These will vary with the judgment of the actuary for the circumstances of each plan.

Determination of Total Cost

By the Commission's recommendation, the Treasury is to determine the true cost of each pension plan and to report this cost to Management Board. As mentioned in Chapter 3, Management Board had developed guidelines for assessing public sector pension plans as early as 1976. The Commission commends this approach. Similar guidelines should be developed immediately to apply to all public sector plans to assist the Treasury in establishing a true cost for each plan with some degree of consistency among the plans for comparability purposes. The timing of the reports under the guidelines should also be correlated to permit a complete picture at a single given time. The guidelines should also incorporate the various recommendations of the Commission affecting the funding of the plans such as abolition of the matching contribution principle, a narrowing of the choice of funding method, and control over actuarial assumptions. (For a critique of existing Management Board guidelines, see Keith Cooper's report in Volume VII).

The Commission recommends that guidelines similar to those developed by Management Board in 1976 for the five largest public sector plans and the WCB be developed by Treasury in carrying out its recommended responsibilities of scrutinizing and evaluating the operation of all public sector plans for cost control purposes, to encourage the proper funding of plans and to discourage over or under-funding.

The Management Board guidelines of 1976 are reproduced as an appendix to Keith Cooper's report in Volume VII. In the development of new guidelines the approach should be to require specific information prepared on a specific basis. For example, all actuarial evaluations for final pay plans should report on the basis of two funding methods: accrued benefit projected and entry age normal. (Where a plan is currently using neither of these methods the first comparative valuation could be on the current method and the method to be adopted). Contribution rates should be developed for each of the funding methods and the contribution rate to be adopted suggested by Treasury to Management Board for comparison with the contribution rate recommended by the plan actuary. Valuations should be in accordance with the general requirements of the Pension Benefits Act.

All pension plans in the public sector having assets of $150 million or more should file an actuarial valuation annually with the Pension Commission of Ontario within nine months of the fiscal year end of the plan. This means that contribution rates will be set annually, to avoid a build-up of undetected experience deficiencies and allow

timely steps to correct any shortfalls or overpayments. The added cost of annual valuations is minimal in relation to the saving which will flow from early identification of problems. The Commission has recommended that the large public sector plans be given nine months to file the actuarial valuation report instead of six months as recommended for all other public and private sector plans. This recognizes the magnitude of the work involved for these plans; but if technically feasible it would be preferable to have a six-month time limit for all plans. All public sector pension plans should have the same fiscal year to co-ordinate the filing of actuarial valuations so that those plans reporting triennially will all report for the same period.

Once this conversion has taken place, the Treasury will be in a position to implement the Commission's following recommendation: that the Treasury in carrying out its recommended responsibility of scrutinizing and evaluating the operation of all public sector plans, review at least every six years the funding of all public sector pension plans through an examination of each plan on a basis consistent for all the plans to allow comparability of plan funding. The results of such examination should be used in assessing the future cost of all the plans through reporting to Management Board, and for reporting to the public.

Implementation of the Commission's other recommendations - abolition of the matching contribution principle, abolition of SABA, full funding of indexing promises, creation of funds for the PSSF and LARA, and the allocation of all costs to a plan - will assist the Treasury in ascertaining for Management Board the complete cost of the pension benefits being provided.

A very important aspect of the cost-determining role of the Treasury will be the costing of plan improvements before they are instituted and to the full extent of their cost. We have commented on problems which have arisen in the plans such as the TSF where plan improvements have created initial unfunded liabilities but the matching contribution principle has limited the funding of these improvements. Although this is not serious for the protection of plan members in terms of wind-up of the plan, it has very serious long-run cost ramifications for the plan. Early retirement without actuarial reduction is expensive and difficult to cost. However, careful utilization studies should be undertaken by Treasury, based on the demographic structure of the particular plan, in seeking to determine the long-run cost. Possible job-sharing by teachers is a case in point where one might anticipate the exercise of early retirement options more frequently than in the past. Such changes will be reflected in the cost, which should be reassessed annually and reflected in contribution rates.

Another area of cost to the government which is not readily recognized is that of reciprocal transfer agreements. The operation of these agreements is often very beneficial to the individual employee and very costly for the government as employer. The Commission believes

that the terms of reciprocal transfer agreements should be reviewed, and where necessary, altered to result in neither gain nor loss to the person making a transfer from one plan to the other, and that rights to additional benefits, such as improved benefits for past service with other plans, be deleted unless arrangements can be made for payment of the additional cost by the employee.

Disclosure and Assessment of Total Cost

Once the Treasury has determined the total cost of pension plans, it is essential that the information be utilized by disclosure to:

(i) Management Board

to enable it to see the total cost of pension benefits in the total compensation package; make cost commparisons with the private sector; and effect cost control through the budgets of the ministries, Crown agencies, and Crown corporations. Additional powers may be required for Management Board to effect control over Hydro, the TTC, and other plans where fiscal control is tenuous;

(ii) Employers and Employees

to enable employers to appreciate the full effect of pension costs when they consider benefit packages for their employees; and to enable employees to assess the value of the benefits they are promised in relation to the contributions required;

(iii) Taxpayers

to enable individuals to compare the cost of the benefits being received in the public sector in relation to the private sector, and to assess the burden the government as employer is undertaking and its effect on the fiscal future on the province.

It might be argued that such disclosure would not be meaningful to most taxpayers and that pensions, being only one cost of government, do not merit such extensive disclosure. The Commission rejects both these arguments. The Treasurer has a good record of presenting complex issues to the public in an understandable way in papers annexed to the Provincial Budget. The New York City experience has alerted taxpayers to the potential pitfalls in public sector pension plans, and therefore information would be welcomed. Pension promises are not just concerned with annual costs. They involve long-range promises which must be paid for by taxpayers, present and future. The shouldering of a fair portion of the burden by successive generations of taxpayers is a concern of all

taxpayers. Only by disclosure can an assessment of the cost division be made.

The six-year review will allow a close scrutiny of unfunded actuarial liabilities and surpluses in all plans with a view to identifying their causes and taking measures to control them.

Effect of Investment on Cost

The major public sector plans, as we have seen, are enormous. Each year the contributions from employees alone are in the millions of dollars. The investment of the funds as an essential element in cost control operates on two principles: the longer the monies are invested, the greater will be the assets created; the higher the rate of return on the monies the greater the assets created. The length of time for investment is a function of the funding method. Therefore, a continuation of funding for public sector plans and control over the funding method as recommended by the Commission are important elements in maximizing investment return. Another important element is the rate of return. The Commission's recommendations for achieving a market rate of return for all public sector plans will be productive in two ways. Rates of return will be set by the market, with accompanying fiscal restraints on the province when it must go to the market to borrow, and may be higher than those experienced in the TSF and PSSF under the present arrangements. More capital allocated through the capital markets should provide a sounder economic base for the province, which in turn should reduce the burden of the taxpayer.

The next section of this chapter deals with a view of how pension costs may develop in the future. It is a frightening prospect indeed if no measures for effective cost control are instituted without delay. Therefore the Commission recommends:

That the Government of Ontario immediately adopt a policy of determining the full and true cost of all pension benefits provided to the employees of the Ontario public sector and to utilize such information for the following purposes:

a) to recognize and control the cost of all such benefits for the full terms of their accrual;

b) to allocate cost fairly between employer and employees;

c) to provide information on such costs to both employers and employees, whether or not such pensions are subject to collective bargaining;

d) to provide information on such costs to taxpayers.

The Commission believes that recognition of the true cost of pensions at the level of Management Board will enable it to control costs in the future. However, if this or some similar alternative is not feasible within the governmental structure, then the Commission recommends:

> If the necessary authority to control pension plan costs cannot be given to Management Board or cannot be successfully used by Management Board to control pension plan costs, that the Government of Ontario consider making changes in pension plan design to convert existing plans to defined contribution plans or some other design in which cost control is effective.

FUTURE PENSION COSTS FOR ONTARIO PUBLIC SECTOR EMPLOYEES

Having ascertained that total pension costs of public sector plans are not now readily available for cost control purposes, the Commission was interested to see if total costs for the future might underline the need for a move to effective cost control now.

The Commission retained Laurence E. Coward of William M. Mercer Limited to prepare a study of the future cost of public sector plans. This study is not a complete actuarial projection for these plans. Rather, it is a study based on one set of assumptions which seemed reasonable to the Commission, forecasting possible growth in the number of public sector employees in the next 25 years, using the Commission's "most probable" assumptions for fertility and economic conditions; and applying these projections to the major public sector plans. The choice of the various assumptions is discussed, but there is no attempt to defend these as the only plausible assumptions for the future. As Mr. Coward states in the report:

> "Our results are best regarded as an example of what would happen if our particular assumptions were borne out by experience, rather than an estimate."

It should be noted that the study takes the plans as they are now. Improvements in the benefit structure or other features would increase the cost. Continuing high inflation would mean that the indexing costs given would be understated.

Some highlights of the study and its conclusions should be noted. On the basis of the assumptions used in the study:

- the total number of public sector employees will more than double in the next 25 years;

- employees in the municipal and health sectors will experience greater growth rates than public servants, teachers, and Hydro employees;

- prices will increase to three times their present level and salaries by five times in the next 25 years;

- public sector employer pension costs, exclusive of CPP contributions but including indexing, will increase from an average of 13.7 per cent to 14.8 per cent of payroll in the next 25 years. (Although this increase seems small it must be remembered that the rates of growth throughout the sub-sectors are different - the greatest growth is in health which has the lowest cost at present).

If these percentages are translated into dollar amounts over the period we can see what large amounts of money will be paid into the plans through contributions; what large amounts of assets will be accumulated in the funds and become available for investment, and how large unfunded actuarial liabilities could become in relation to the financial base of the total number of taxpayers in the province.

How significant these pension obligations will appear a quarter century from now depends largely on the rate of economic development in the meantime: how steadily productivity will increase and whether Ontario's Gross Provincial Product will grow sufficiently to accommodate the growth in public sector expenditures, payrolls, and pension costs. No precise assessment of "affordability" has been attempted by the Commission, however. We are much more concerned with the need, as demonstrated in this chapter, for intelligent and co-ordinated planning of public sector expenditure on pensions - whether the level of pensions be generous or merely adequate. Affordability can be properly assessed only when and to the extent that costs are determinable and controllable.

In the study paper which follows, Mr. Coward takes an informed look at the growth prospects, over the next twenty-five years, for Ontario public sector employment payrolls and pension costs.

FUTURE PENSION COSTS, ONTARIO PUBLIC SECTOR: A SCENARIO

Introduction

Pension costs in the public service have become a very important and growing item of provincial expenditure. Concern has been expressed that the burden placed on future taxpayers might become intolerable, with serious effects both for the former employees and for the provincial economy. Accordingly, an examination has been made of the likely trend and the impact of employee benefits provided by the Government of

Ontario. The prime objective of the study is to estimate at five-year intervals over the next 25 years the cost of pensions for Ontario public servants in relation to payrolls and other indices.

The Ontario public sector is taken to include five major sub-sectors: Provincial Government, Municipal Government, Health, Education and Provincial Utilities. Each of these sub-sectors is dominated by one major pension plan: the Public Service Superannuation Fund, the Ontario Municipal Employees Retirement System, the Hospitals of Ontario Pension Plan, the Teachers' Superannuation Fund and the Ontario Hydro Plan. These five plans together encompass over 80 per cent of all Ontario public sector employees.

At the end of 1977 the Ontario public sector included 455,000 active employees and there were some 75,000 pensioners. The employers were contributing some $400 million a year and the employees some $300 million. The assets of the plans amounted to $7.5 billion and the value of earned pensions is estimated to be in the order of $10.4 billion. These numbers and dollar amounts are all rising rapidly.

In what follows we will be concerned only with the benefits financed by the Government of Ontario. The study therefore excludes the Ontario-based employees of the federal public service, the Armed Forces, the RCMP and other Government of Canada organizations. It also excludes the benefits and contributions of Ontario public service employees under the Canada Pension Plan.

Methodology

1. Assumptions were made as to future growth rates of employment in the five sub-sectors, taking into account the likelihood that each would grow faster or slower than the total population of the province. Growth in the work-force is likely to differ markedly from one sub-sector to another for reasons which are discussed below.

2. Pension costs depend not only on the number of employees but also on their age distribution. In order to obtain an indication of the age and sex distribution in future years, five-year survival rates were developed and applied to the present age distributions which are available in five-year age groups. By applying these rates, for example, to the number of employees age 50-54 in the year 1980 one would obtain the number of employees age 55-59 in the year 1985. New employees are assumed to join each sub-sector in such numbers as will maintain the assumed growth rate of total employment, as determined in step (1) above. Entry ages of the new entrants for the five sub-sectors are taken to be distributed in the same manner as actual entrants in recent years to the five major pension plans.

The result of this process is to generate an estimate of the numbers and ages of the employees in each sub-sector at five-year intervals from 1980 to 2005.

3. In the next step an estimate is made of the salaries of these employees. The projection of salaries will allow for two factors:

   a) the manner in which average salary varies with age, based on current statistics;

   b) the assumption as to the overall rate of salary increase with time.

   The "most probable" assumptions established for all the actuarial work undertaken by the Commission are used throughout. Thus overall salary increases will be 7.3 per cent from 1980-84, 7.0 per cent from 1985-89, and 6.1 per cent from 1990.

4. Next, pension costs in each of the five sub-sectors in future years are estimated as percentages of salary, having regard among other things to the changing age distribution. Recent plan amendments must be considered; for example, the change in the Ontario Municipal Employees Retirement System from a career average to a final average earnings basis on January 1, 1978, and the recently introduced indexing of pensions up to 8 per cent per annum for public servants and teachers. While allowance is made for recent amendments, the estimates will assume no further change in the terms of the pension plans or of social security benefits, in particular the Canada Pension Plan.

Growth Rates in the Five Public Service Sub-sectors

Statistics on the growth of government employment and population are given in Tables 7, 8, and 9.

Table 7 shows that Ontario government employment has grown about twice as fast (3.7 per cent per annum in 1961-76) as the total population (1.9 per cent per annum). Nevertheless, the growth rate in 1971-76 was much less than in the previous five years, 1966-71.

Table 8 illustrates vividly the different growth rates of employment in the different sub-sectors, and demonstrates that they have varied greatly over the years. Figures are given both for total sub-sector and for the major pension plan of the sub-sector (i.e., PSSP, OMERS, HOOPP, TSF, and Hydro).

Table 9 shows the projected population in Ontario on the Commission's most probable estimates. It will be seen that the projected

growth rate of the population age 0-19 is only .7 per cent per annum on the average, compared with 1.5 per cent for the population of working age and 2.2 per cent for those over age 65.

These statistics form the background for making the necessary assumptions as to growth rates in the five sub-sectors of government employment.

Table 7
Provincial Government Employment and Population, 1961-1976 (showing number and annual percentage growth rates)

Year	Provincial government employment (June 30)(a)				Population(b)			
	Ontario	(Per cent)	Canada except Quebec and British Columbia	(Per cent)	Ontario	(Per cent)	Canada	(Per cent)
1961	75,847		162,880		6,236,092		18,238,247	
1966	84,914	2.3	191,249	3.4	6,960,870	2.3	20,014,880	1.7
1971	118,397	6.8	267,522	7.0	7,703,105	2.1	21,568,310	1.6
1976	130,977	2.1	314,324	3.2	8,264,465	1.4	22,992,605	1.4
Annual growth rate 1961-1976		3.7%		4.5%		1.9%		1.6%

a Provincial Government as Employers.
b Census of Canada.

Table 8
Growth of Employment in Ontario Public Sector (showing number and annual percentage growth rates)

Year end	Provincial government sub-sector	(Per cent)	PSSF	(Per cent)	Municipal government sub-sector	(Per cent)	OMERS	(Per cent)	Health sub-sector	(Per cent)	HOOPP	(Per cent)	Education sub-sector	(Per cent)	TSF	(Per cent)	Provincial utilities sub-sector	(Per cent)	Ontario Hydro	(Per cent)
1960	29,768	7.6	28,413	7.8							10,988	16.9			48,001	8.7				
1965	42,904	8.5	41,432	8.7	50,421	12.0	23,918	22.1			23,942	11.0			73,006	5.0			11,953	5.6
1970	64,538	9.3	62,888	9.3	88,971	6.7	64,993	11.8			38,819	10.0	116,617	12.8	93,000	13.6			15,711	8.4
1971	70,563	2.5	68,735	2.4	94,931	4.4	72,629	6.3	45,588	11.2	42,694	11.0	131,515	12.5	105,657	13.5	17,373	8.2	17,032	.9
1972	72,339	3.4	70,379	3.4	99,074	6.2	77,258	8.5	50,681	3.6	47,409	3.6	147,926	16.3	119,873	16.8	18,794	.7	17,187	1.6
1973	74,823	2.6	72,748	2.5	105,207	3.7	83,854	5.8	52,505	3.3	49,098	3.6	171,264	-4.1	139,971	-5.8	18,918	2.1	17,461	3.8
1974	76,770	1.4	74,540	1.1	109,136	7.6	88,708	9.7	54,256	5.3	50,872	5.1	164,180	.1	131,808	4.2	19,308	2.8	18,126	6.8
1975	77,849	-.3	75,371	-.4	117,484	3.9	97,275	5.3	57,114	11.7	53,474	11.6	164,411	5.0	137,280	1.4	19,856	6.2	19,355	1.0
1976	77,623	2.4	75,065	2.2	122,020	2.7	102,432	3.6	63,794	5.5	59,680	5.6	172,707	-1.0	139,138	-1.7	21,084	1.0	19,555	4.7
1977	79,476		76,712	-	125,270		106,143	8.9	67,271		63,000	2.9	170,899		136,711	-1.0	21,285		20,478	7.4
1978			77,564	-.7			115,615	.4			64,823	.4			135,298				21,997	5.0
1979			77,047				116,134				65,052								23,100	

Source Ontario Public Service Pension Plan Data, and supplemental data from Ministry of Treasury, Economics and Intergovernmental Affairs.

Table 9
Population of Ontario, 1975-2005

Year (July 1)	Ages 0-19			Ages 20-64			Ages 65 and over			All ages		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
	(in thousands)											
1975	1,522	1,451	2,973	2,387	2,356	4,743	304	412	716	4,213	4,219	8,432
1980	1,525	1,452	2,977	2,653	2,622	5,275	349	471	820	4,527	4,545	9,072
1985	1,594	1,518	3,112	2,920	2,880	5,800	384	531	915	4,898	4,929	9,827
1990	1,746	1,659	3,405	3,081	3,034	6,115	443	617	1,060	5,270	5,310	10,580
1995	1,855	1,761	3,616	3,222	3,174	6,396	495	689	1,184	5,572	5,624	11,196
2000	1,879	1,784	3,663	3,414	3,372	6,786	534	744	1,278	5,827	5,900	11,727
2005	1,847	1,753	3,600	3,678	3,638	7,316	569	793	1,362	6,094	6,184	12,278
Annual growth rate 1975-2005			.7%			1.5%			2.2%			1.3%

Source Royal Commission on the Status of Pensions in Ontario, CPP Financial Projections.

The rates of growth in the number of public sector employees will have a very important effect on the cost of employee benefits. A small change in annual growth rate has a large effect when compounded over periods up to 25 years. Although statistics are available as to public service employment in past years separately for the five sub-sectors considered in this report, the factors that influence public service growth have been changing. Because the background of demography, politics, economics and social standards is involved, the assumptions of growth rate are somewhat speculative.

Two factors, potentially of great significance, are particularly hard to assess. One is the granting of the right to strike to public service employees, which strengthens the bargaining position of their associations and thus makes it more difficult to control the levels of public service employment and remuneration. The other, which operates in the opposite direction and has become stronger in the last few years, is taxpayer resistance. This has not only slowed the provision of new government services but has even resulted in cutbacks in some existing services.

Essentially we have assumed a continuation of the trends in recent years, allowing for certain obvious influences, but ignoring such possibilities as a major economic depression or a taxpayers' revolt similar to that in California. Our assumptions are thought to be reasonable; but a much more sophisticated study would be needed to arrive at a "best estimate" of growth rates (which no doubt would vary with calendar year instead of being level as we have assumed). Accordingly the results are best regarded as an example of what would happen if our particular assumptions were borne out by experience, rather than an estimate. The fact that we arrive at a greatly increased cost of provincial government does not mean that our assumptions are improbable. It does mean that present trends to depend more and more on government services give cause for concern in the area of future cost.

Provincial Government

The Ontario public service has grown greatly but unevenly in the past. The ups and downs in growth have been in response to the demands for new government services, the absorption of outside organizations into the government, and budget stringency.

Recently the government has adopted a restraint program, and there appears to be growing pressure against tax increases as well as a movement to decentralize certain operations. On the other hand, the public service associations have obtained the right to strike, which puts them in a stronger position to resist cutbacks.

Taking all these factors into account, we anticipate that total employment in the provincial government sector will grow slightly faster than the total adult population, say at 2 per cent per annum.

Municipal Government

Municipal employment has been growing much faster than provincial. OMERS shows even faster growth, but this is not a sure guide because OMERS is an immature plan which will eventually cover an even larger percentage of the municipal sub-sector. Factors that may encourage the increase in municipal employment include continuing urbanization leading to additional demands for police, fire, garbage, roads and other services. In addition, services now contracted out to private employers are increasingly being provided directly by municipal employees. In spite of resistance to higher property taxes, the demand for additional municipal services is strong.

The annual growth rate in the municipal sub-sector was 12 per cent from 1965 to 1970 and 5 per cent from 1970 to 1977. An employment growth rate of 4 per cent per annum has been assumed for the future.

Health

This is a rapidly growing sector, potentially subject to almost insatiable demands from the public. Medical advances are costly both in money and manpower. Public health measures have reduced sickness, but higher health standards are demanded by all sectors of the population, especially as the cost of health care is prepaid. It is also possible that government will have to participate in new forms of medical coverage such as dental and vision care. As the remuneration of doctors increases, there will be need for paramedics employed in the health sector. A growth rate equal to that of the population plus at least 3 per cent per annum seems likely, for a total of 5 per cent per annum.

Education

Teachers are the victims of demographic change because of the dramatic fall in the birth rate that took place in the 1960s. The number of people in education actually fell in certain years after 1973, and in fact employment is no higher today than it was in 1973. The increasing demand for adult education and smaller classes do not make up for the smaller number of children and the increasing cost of higher education.

The teaching force in Ontario schools was estimated by the Commission on Declining School Enrolments in Ontario as follows:

Academic year	Elementary and secondary school enrolmment
1980	90,233
1990	86,090
2000	88,526

Over the 20 years this is a decline of .15 per cent per annum. However, the fertility assumptions adopted by the Commission result in a 20 per cent increase in population under age 20 between 1975 and 2005, or a .7 per cent annual rate of increase. In view of the above, employment in education is assumed to increase at .75 per cent per annum.

Provincial Utilities

Ontario Hydro has cut back on its projection of future energy needs. Nevertheless, per capita usage of energy seems certain to increase. The move to a "conservation society" is unlikely to reduce aggregate demand significantly. Measures to protect the environment may well result in more manpower being needed to produce a given amount of energy. Even if energy is produced more efficiently, and demand does not increase as fast as it has in the past, a growth rate of 3 per cent per annum is likely.

Age-Sex Distribution

The distribution of employees in five-year age groups and five-year service groups is available for the major pension plans in four of the five sub-sectors (separately for males and females) subject to minor omissions. Unfortunately such a full breakdown is not available from OMERS; however, from the distribution of OMERS employees in ten-year age groups a fair approximation to the current age distribution of the municipal sector may be estimated.

The distribution by age group and sex (omitting service) is shown in Table 10.

Table 10
Age Distribution of Employees, Ontario Public Sector, December 1977

Age	Provincial government		Municipal government(a)		Health		Education		Provincial utilities	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Female
-24	2,753	5,357	6,468	5,768	568	5,119	1,580	6,110	1,474	725
25-29	7,214	5,487	11,591	5,923	1,533	9,347	10,936	22,333	3,113	768
30-34	7,161	3,652	12,103	4,017	1,838	6,439	14,930	14,306	3,110	466
35-39	5,757	2,674	9,927	3,889	1,577	5,539	12,914	9,907	2,150	271
40-44	5,402	2,452	9,611	3,586	1,339	4,953	8,941	7,042	1,875	204
45-49	5,565	2,543	10,595	3,856	1,470	5,261	6,860	5,909	2,318	217
50-54	6,177	2,883	11,263	4,389	1,537	5,207	5,030	4,623	2,295	228
55-59	5,737	2,607	9,362	3,179	1,562	4,459	3,380	3,275	1,723	169
60-64	4,002	1,764	6,387	2,164	1,426	3,113	1,928	2,081	872	65
65	193	59	577	174	291	398	173	147	54	3
Total	49,981	29,478	87,884	36,945	13,141	49,835	66,672	75,733	18,894	3,116
	79,459		124,829		62,976		142,405		22,100	
Age not known	428		4,186		6,134		12,299		-	
	79,887		129,015		69,110		154,704		22,100	

a Partly estimated.

Source Ontario Public Sector Pension Plan Data.

The proportions of males and females vary remarkably in the five sub-sectors:

	Males	Females
	(Per cent)	
Provincial government	62.9	37.1
Municipal government	70.4	29.6
Health	20.9	79.1
Education	46.8	53.2
Provincial utilities	85.9	14.1
All sub-sectors (weighted average)	54.8	45.2

The above ratios are derived from statistics at the end of 1977. The sex ratios have changed very little in the last ten years, except in education where the percentage of males has been rising.

The percentage of females in the work-force in 1980 (derived from population figures and work-force participation rates used elsewhere in the Commission's report) is 40.3 per cent, and is expected to rise to 41.5 per cent by year 2005. As the difference is so small, and as no trend for government to employ a larger proportion of females can be observed, we assume no change in the ratios of males to females in future.

It will be observed that the public service as a whole is employing a larger percentage of females (45.2 per cent) than the percentage of females in the total work-force (40.3 per cent). However, the percentage differs greatly among different public service employers.

Five-Year Survival Factors

The five-year survival factors are shown in Table 11. These are based on the following actuarial assumptions, which as far as possible parallel those used in the actuarial valuations of the plans.

Termination Rates

The probabilities of terminating employment have a very important effect on the age-service distribution of employees in future years. Terminations reduce the cost of pension plans, both because some employees lose their pension rights and because those who have vested deferred annuities are not fully protected from inflation and receive less for their years of service than if they had not terminated.

Table 11
Five-year Survival Factors, Showing Probability that an Employee at a Given Age Will Still be in Service Five Years Later - Ontario Public Sector

Age	Provincial government, Municipal government and Health		Education and Provincial utilities	
	Males	Females	Males	Females
22	.388	.190	.694	.593
27	.572	.278	.810	.695
32	.660	.404	.867	.776
37	.728	.544	.897	.820
42	.783	.643	.916	.875
47	.799	.686	.915	.887
52	.779	.714	.878	.836
57	.627	.515	.683	.604
62	0	0	0	0

Earlier vesting and a greater degree of indexing would of course reduce these losses, but we are assuming that the present plan terms remain unchanged.

Examination of the past and the termination rates used in the actuarial valuations shows that the rates for the PSSF, OMERS and HOOPP are not very different (Table 12). Accordingly, we adopted the rates used in the last actuarial valuation of the Public Service Superannuation Plan, which were based on actual experience of the plan in the 1965-73 period.

The termination rates for teachers and Hydro employees appear to be significantly lower than for the other groups. Indeed no withdrawals from employment were allowed for in the last actuarial valuation of the Hydro Pension Plan, and the actuarial report states: "An examination of the rates of termination of employment shows that less than 1 per cent of members terminate with over 5 years' service. Members terminating with less than 5 years' service have very little financial effect on the Plan."

The termination rates adopted in the last valuation of the TSF for those with three or more years of service are also very low (e.g., below 1 per cent for males age 40 or over and females age 45 or over). Accordingly, we developed a set of termination rates appropriate to the teachers and Hydro employees, which rates are much less than those of provincial government, municipal government and hospital employees.

Table 12
Termination of Employment Rates from Actuarial Reports, Ontario Public Sector

	Public Service Superannuation		OMERS		Hospitals of Ontario		Teachers' Superannuation				Ontario Hydro	
							First year		After 3 years			
Age	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
20	.263	.320	-	-	.250	.285	-	-	-	-	-	-
25	.145	.274	.149	.299	.160	.250	.113	.141	.018	.070	-	-
30	.097	.213	-	-	.115	.200	.113	.149	.016	.052	-	-
35	.075	.146	.074	.139	.090	.125	.113	.143	.012	.027	-	-
40	.059	.103	-	-	.060	.075	.113	.135	.008	.014	-	-
45	.042	.074	.027	.058	.010	.025	.113	.128	.005	.008	-	-
50	.033	.060	-	-	-	-	.113	.119	.005	.005	-	-
55	.023	.025	-	.014	-	-	-	-	.005	.005	-	-

Note: No terminations are assumed in Ontario Hydro actuarial report, which states that less than 1 per cent of members terminate with over 5 years' service.

Mortality

Group Annuity Mortality Table for 1971 (GAM 1971).

Disability

Public service rates, modified in the case of teachers.

Retirement

The pattern of retirement by age does not vary greatly from plan to plan. We adopted the retirement age probabilities shown in the 1973 actuarial valuation of the Public Service Superannuation Plan (see Table 13).

Entry Ages

The ages at which new employees are hired are assumed to be the same as in recent years, as estimated from the age distribution of employees with under five years of service. It is notable that recruitment takes place over a wide spread of ages in Ontario government service and health organizations, while teachers and Hydro employees are generally hired at younger ages. The distribution used in the calculation is shown in Table 14.

It should be noted that the various rates mentioned above are not being used to make an actuarial valuation of the groups, but to estimate changes in the age distributions with time. The assumptions that have been made are quite broad, but should be sufficient to determine in a rough way the trend of public service pension costs.

The information as to entry ages of Municipal government employees was inadequate; accordingly it was assumed that they would have the same entry age distribution as Provincial government employees.

Table 13
Estimated Average Retirement Age

	Males	Females
Provincial government	62.2	60.7
Municipal government	61.5	61.4
Health	63.0	63.0
Education	63.1	62.2
Provincial utilities	N/A	N/A
Average age calculated from the assumptions (excluding disability)	63.2	62.5

Source Public sector study (Volume VII).

Retirement Rates Adopted

Age	Males	Females
55	.0084	.0174
56	.0110	.0184
57	.0115	.0201
58	.0183	.0215
59	.0277	.0369
60	.1237	.2004
61	.0786	.0899
62	.0635	.0832
63	.0557	.0769
64	.0839	.0997
65	1.0000	1.0000

Table 14
Entry Ages of New Employees, Ontario Public Sector(a)

Central age	Provincial government		Municipal government		Health		Education		Provincial utilities	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	(Per cent)		(Per cent)		(Per cent)		(Per cent)		(Per cent)	
20	19.1	35.5			11.3	22.9	10.1	20.4	25.0	48.9
25	28.9	24.5			22.6	30.3	49.1	41.4	33.9	26.9
30	16.4	13.1			19.5	14.2	21.0	15.2	18.9	11.4
35	9.9	8.0			12.4	9.8	8.9	10.7	10.3	5.8
40	7.7	6.7			9.7	8.2	4.5	6.0	5.4	2.9
45	7.3	5.3			8.4	6.6	3.1	3.6	3.2	2.4
50	6.2	4.5			9.1	5.0	2.0	1.8	2.0	1.0
55	4.5	2.4			7.0	3.0	1.3	.9	1.3	.7
	100.0	100.0			100.0	100.0	100.0	100.0	100.0	100.0

a Entrants at age 60 and above omitted.

Source Ontario Public Service Pension Plan Data.

Population Projections 1980 to 2005

On the above data and assumptions we have calculated the age distribution of male and female employees in each of the five sub-sectors for the years 1980, 1985, 1990, 2000 and 2005. These numbers of employees are shown in five-year age groups for each sex.

Table 15 shows the estimated total number of employees for the five sub-sectors from 1980 to 2005. In aggregate we expect the size of the Ontario public sector to more than double in the next 25 years.

From the same table it can be seen that Ontario public employment as a whole, expressed as a percentage of the Ontario population of working age (20 to 64) will rise from about 8.8 to 13.2 per cent, a very significant shift. Provincial plus municipal government employment will rise from 4.1 to 6.7 per cent.

Table 16 shows for 1980 and 2005 the percentage distribution of employees by age group. The provincial and municipal government sectors are likely to get younger, due to the expansion of staff and hiring new recruits at relatively young ages. Rapid growth will keep the distribution young. The same applies, to a slightly less degree, to the health sector, which tends to recruit new employees at higher ages than government service. Education, a slow-growth sector with low terminations of employment, is however a marked exception, the average age rising substantially. The age distribution of Hydro employees will not be very greatly changed, since we expect the same trends in future as in the past, which means that fairly rapid growth will be offset by exceptionally low terminations of employment.

Table 15
Estimated Number of Employees, Ontario Public Sector Employment by Sub-sector, 1980-2005

	Provincial government	Municipal government	Health	Education	Provincial utilities	All sub-sectors
Males						
1977	50,287	88,928	14,258	72,405	18,966	244,844
1980	50,539	92,485	14,685	72,405	21,344	251,458
1985	55,799	112,522	18,742	75,162	24,743	286,968
1990	61,606	136,900	23,919	78,023	28,685	329,133
1995	67,113	166,558	30,529	80,993	33,253	378,446
2000	75,098	202,644	38,963	84,077	38,549	439,331
2005	82,913	246,546	49,727	87,277	44,688	511,151
Females						
1977	29,600	40,087	54,852	82,299	3,134	209,972
1980	29,745	41,691	56,498	82,299	3,509	213,742
1985	32,841	50,724	72,107	85,431	4,068	245,171
1990	36,259	61,713	92,029	88,684	4,716	283,401
1995	40,033	75,083	117,454	92,060	5,467	330,097
2000	44,199	91,349	149,904	95,565	6,338	387,355
2005	48,799	111,141	191,320	99,203	7,348	457,811
Total						
1977	79,887	129,015	69,110	154,704	22,100	454,816
1980	80,284	134,176	71,183	154,704	24,853	465,200
1985	88,640	163,246	90,849	160,593	28,811	532,139
1990	97,865	198,613	115,948	166,707	33,401	612,534
1995	107,146	241,641	147,983	173,053	38,720	708,543
2000	119,297	293,993	188,867	179,642	44,887	826,686
2005	131,712	357,687	241,047	186,480	52,036	968,962

Table 16
Age Distributions, Ontario Public Employment by Sub-sector, 1980 and 2005

	Provincial government				Municipal government				Health				Education				Provincial utilities			
	Males		Females		Males		Females		Males		Females		Males		Females		Males		Females	
Age group	1980	2005	1980	2005	1980	2005	1980	2005	1980	2005	1980	2005	1980	2005	1980	2005	1980	2005	1980	2005
	(Per cent)				(Per cent)				(Per cent)				(Per cent)				(Per cent)			
-24	5.5	8.0	18.2	22.3	7.4	9.1	15.7	23.7	4.4	5.5	10.4	15.1	2.4	2.3	8.1	5.6	7.8	7.3	23.3	17.8
25-29	14.4	15.0	18.6	19.2	13.3	16.6	16.1	20.0	11.9	12.7	18.9	22.3	16.4	12.5	29.6	14.5	16.5	14.4	24.7	19.0
30-34	14.3	14.7	12.4	13.1	13.9	15.7	10.9	13.3	14.3	15.2	13.0	14.3	22.5	15.2	18.9	13.6	16.4	15.9	15.0	15.7
35-39	11.5	13.0	9.1	9.8	11.4	13.3	10.6	9.8	12.3	13.0	11.2	11.0	19.4	13.2	13.1	13.1	11.4	15.3	8.7	12.9
40-44	10.8	11.9	8.3	9.0	11.0	11.6	9.8	8.8	10.4	12.7	10.0	10.1	13.4	11.8	9.3	12.0	9.9	13.5	6.5	10.3
45-49	11.1	11.4	8.7	8.6	12.1	10.9	10.5	8.2	11.4	12.0	10.7	9.5	10.3	11.0	7.8	11.8	12.2	11.7	7.0	9.2
50-54	12.4	11.1	9.8	8.2	12.9	10.0	11.9	7.6	12.0	12.0	10.5	8.4	7.6	12.4	6.1	14.4	12.1	10.2	7.3	7.9
55-59	11.5	9.6	8.9	6.7	10.7	8.5	8.6	6.0	12.2	10.7	9.0	6.6	5.1	13.3	4.3	10.1	9.1	7.9	5.4	5.1
60-	8.5	5.3	6.0	3.1	7.3	4.3	5.9	2.6	11.1	5.3	6.3	2.7	2.9	8.3	2.8	4.9	4.6	3.8	2.1	2.1
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Projection of Payrolls

Having obtained the estimated numbers of employees by sex and age group in future years, we may then estimate the payrolls. Salary depends on sex and age as demonstrated in Table 17. Although the law against discrimination requires males and females to be paid equally for equal work, it appears that at present females generally have less senior positions. Assuming that this situation changes in favour of the females we may expect female remuneration to rise somewhat faster than the average and male remuneration somewhat slower. As we have assumed for reasons noted above that the male to female ratio in the public service will not alter significantly, and that salaries will rise overall in accordance with the Commission's most probable economic assumptions, a shift towards equalizing male and female salaries will not alter the aggregated payrolls.

An exception to the general observation that average salaries of females are less than those of males is found in the members of HOOPP, where females under age 30 earn on average more than the males. In all other age groups however, the males on average earn more.

Pension Costs as a Percentage of Pensionable Payroll

Provincial Government

Currently employees contribute to the Public Service Superannuation Plan 6 per cent of their salaries, reduced by their contributions to the Canada Pension Plan. The employer matches these contributions and also pays for any deficiencies that may arise.

Table 17
Salaries by Age Group, Ontario Public Employment, by Sub-sector - Dollar Average and Percentage of Average for All Ages

Age group	Public Service Superannuation Plan 1976				Teachers' Superannuation Plan 1978				Hospitals of Ontario Pension Plan 1978				Ontario Hydro Pension Plan 1977			
	Males		Females		Males		Females		Males		Females		Males		Females	
	($)	(%)	($)	(%)	($)	(%)	($)	(%)	($)	(%)	($)	(%)	($)	(%)	($)	(%)
-24	11,710	71.7	9,956	86.3	13,400	55.4	13,277	71.3	11,534	75.8	12,681	92.4	14,780	69.7	11,703	85.7
25-29	14,347	87.8	11,518	99.9	16,967	70.1	16,407	88.1	13,341	87.6	14,352	104.5	17,987	84.8	13,372	97.9
30-34	16,435	100.5	12,082	104.8	22,083	91.3	19,223	103.1	15,148	99.5	14,428	105.1	20,898	98.5	14,341	105.0
35-39	17,372	106.3	12,056	104.5	26,063	107.7	19,592	105.1	16,497	108.3	14,353	104.5	22,679	106.9	14,865	108.8
40-44	17,656	108.0	11,997	104.0	27,283	112.8	19,800	106.3	16,538	108.6	14,041	102.3	22,570	106.4	15,187	111.2
45-49	17,809	109.0	12,057	104.5	27,946	115.5	20,538	110.2	16,291	106.9	13,785	100.4	22,389	105.5	14,463	105.9
50-54	17,320	106.0	11,805	102.3	28,101	116.1	21,009	112.7	15,934	104.6	13,077	95.3	23,665	111.5	15,015	109.9
55-59	16,619	101.7	11,958	103.7	27,458	113.5	21,150	113.5	15,220	99.9	12,641	92.1	23,605	111.2	14,823	104.2
60-	15,804	96.7	11,785	102.2	26,486	109.5	20,004	107.3	14,540	95.5	12,356	90.0	23,387	110.2	14,926	109.3
All ages	16,342	100.0	11,534	100.0	24,203	100.0	18,637	100.0	15,233	100.0	13,279	100.0	21,220	100.0	13,660	100.0

In addition, both employer and employee pay 1 per cent of salary to the Superannuation Adjustment Fund (SAF) which provides for the indexing of pensions with the Consumer Price Index, up to an 8 per cent increase in any one year. Pensions of those who retired prior to 1976 are indexed by direct payments from the Consolidated Revenue Fund.

The total of both employer and employee payments, including special payments to liquidate deficiencies but excluding the SAF contributions, was estimated at 13.2 per cent of gross payroll in 1976 (TEIGA survey). Taking employee contributions as averaging 5 per cent, this suggests an employer cost of 8.2 per cent of gross pay. In the public sector study, employer contributions, including the extra 1 per cent to SAF, are estimated as a percentage of pensionable payroll to be 9.60 per cent in 1976 and 9.94 per cent in 1977.

The actuarial report as at December 31, 1976 puts employer contributions to the Public Service Superannuation Fund at 6 per cent of pensionable salary less CPP contributions plus special payments of $54.5 million, the last item being equivalent to 5 per cent of pensionable salary. This indicates a total employer contribution of 10.1 per cent of payroll in 1976. The report points out that post-retirement adjustments to compensate for inflation are not paid from the PSSF but from the Consolidated Revenue Fund or from the SAF. Accordingly, the 10.1 per cent does not include the cost of indexing pensions.

The special payments of $54.5 million include a constant item of $6.0 million, that is, the interest on the initial unfunded liability. This item is .55 per cent of 1978 pensionable payroll, and the percentage will fall to under .10 per cent in 25 years due to growth of payrolls. For this reason the employer's cost could be expected to fall as a percentage, but as other items may increase the costs, we have ignored this reduction. Although the existing deficiencies are being liquidated in 15 years or less through the special payments, further deficits are expected to arise from time to time because the employer's current service contribution is fixed by legislation. The cost to the government of the Public Service Plan is therefore taken as 10.1 per cent of salary, plus a minimum of 1 per cent for the SAF, plus indexing cost for those who did not contribute to SAF.

Municipal Government

Because OMERS is immature and was fundamentally altered effective January 1, 1978, to provide pensions on a final 5-year average basis, only information for the last two years as to employer costs is relevant. The actuarial report on the new plan states that the specified contribution rates of employees (averaging 6.1 per cent of earnings), plus equal contributions from the employer, will be adequate to support the basic OMERS pensions for the foreseeable future. On a level cost method the actuarial report shows that special payments of 1.2 per cent

of earnings are also required. Employer costs therefore comprise the following items:

1. Regular contributions averaging 6.1 per cent of earnings. (Regular contributions are 5.5 per cent of earnings up to the YMPE plus 7 per cent on excess earnings, plus 1 per cent additional for employees with normal retirement age of 60, who comprise 14 per cent of total membership).

2. Special payments of 1.2 per cent of earnings.

3. The cost of prior service benefits and supplementary benefits purchased by the municipality, which was 1.5 per cent of payroll in 1978, nearly all paid by the employer.

4. Any deficits arising in future; deficits are now more likely to occur and would require an adjustment of the contributions specified under the act.

5. The cost of indexing or otherwise increasing pensions for inflation if these additions are awarded in future.

Assuming the same mix of basic and supplementary benefits in future, the total employer cost may be put at (1) plus (2) plus (3) - that is, 8.8 per cent of members' earnings. From another point of view, in the long run the OMERS plan will probably require total contributions roughly the same as those under PSSF, but the members are paying just over 1 per cent more than members of PSSF. Hence the cost has been put at 9 per cent, exclusive of the cost of indexing.

Health

The Hospitals of Ontario Pension Plan requires employee contributions equal to 4.5 per cent of salary up to the YMPE and 6 per cent on salary in excess. The 1978 actuarial report recommends employer contributions equal to 158 per cent of employee contributions, which will cover both current service costs and special payments. This means that employee contributions of about 7.7 per cent of payroll are recommended. This figure is consistent with that in the public sector study. The plan is funded by an accrued benefit method (with salary projection) which requires lower contributions than a projected method so long as the number of members is increasing.

Pensions after retirement have only once been increased. In 1979 increases of 40 per cent were granted to those who retired before 1974, with lower increases for more recent retirees. The cost of the pensioner increases is .2 per cent of salary, included in the 7.7 per cent figure. We have assumed the employer cost to be 7.7 per cent excluding indexing, which therefore allows for a small increase in future. This estimate depends on the assumption that employment in the health sector

will continue to rise fairly rapidly. If employment were to stabilize or decline, one would expect the average age to rise; and, because of the funding method employed by HOOPP, the employer's pension cost percentage would also increase.

Education

The employees contribute to the Teachers Superannuation Fund 6 per cent of salary reduced by contributions to the Canada Pension Plan, or on average roughly 5.2 per cent of total salary. Teachers also contribute 1 per cent, matched by the employer, to the SAF.

It is not easy to reconcile the data produced by TEIGA with those in the public sector study (Volume VII). Contributions are shown as follows:

Year	(1) TEIGA: Total contribution plus special payments as percentage of gross payroll	(2) Column(1) less 5.2 per cent for employee contributions	(3) Public sector study: Employer payments as percentage of pensionable payroll(a)
	(Per cent)	(Per cent)	(Per cent)
1977			12.75
1976			9.84
1975	17.1	11.9	15.74
1974	20.8	15.6	14.80
1973	14.2	9.0	7.61
1972	15.2	10.0	8.65
1971	14.7	9.5	8.64

a Excludes indexing cost.

The actuarial report as at December 31, 1978 (which does not include indexing costs and supplements) recommends that the employer make the following contributions:

1. Regular contributions matching those paid by employees, equal to 6 per cent of salary reduced by CPP contributions, say 5.2 per cent of total salary.

2. Special payments of $119,827,000 of which $22,980,000 represents interest on the initial unfunded liability and is payable in perpetuity. The other special payments expire on average in 1989. The special payments amount to 5.3 per cent of pensionable earnings at the valuation date. As in the public service, the interest portion will decline as a percentage from the present 1 per cent, but no specific allowance has been made for the decline.

3. The actuarial report points out that the regular contributions of the employer ought to be higher by .8 per cent of salary, if new teachers are not to cause losses when they enter the plan. This suggests that employer contributions of about 11.3 per cent are required, exclusive of indexing cost.

In considering the employer contributions for the future, it should be noted that the actuarial assumptions were changed in the last valuation, giving rise to a large reduction in unfunded liabilities of a non-recurrent nature.

The average employer payment for 1971 to 1975 from the TEIGA figures shown above is 11.2 per cent; the average for 1971 to 1977 from the public sector study is 11.1 per cent. Unfortunately, the payments have been irregular and data for recent years are not available. Based on the information we have, it is not unreasonable to assume that employer costs will be 11.2 per cent in future (excluding indexing).

Provincial Utilities

Less information is available as to the Ontario Hydro pension costs than the other plans. Employees contribute 3-7/16 per cent of earnings up to the YMPE and 5 per cent on earnings in excess; they do not contribute towards indexing for inflation.

In the public sector study, employer contributions are estimated at 15.5 per cent in 1977, including the cost of upgrading the pensions of retired employees. Over the five years ending in 1977 the average is 13.4 per cent.

The actuarial report on the Ontario Hydro Plan as at December 31, 1977, finds the 1978 current service cost to be 9.5 per cent of payroll, and recommends unfunded liability payments of $35.6 million equivalent to 7.8 per cent of the estimated 1978 salaries. This includes about .5 per cent arising from the 1977 pension increases (when pensions in payment were raised by 8 per cent). In addition, the 1976 liability is being paid off faster than required by the Pension Benefits Act, so that the special payments are $11.9 million (2.6 per cent) higher than would otherwise be the case. Thus the actuarial report suggests an employer cost of about 14.2 per cent excluding indexing, if new unfunded liabilities arise at each valuation (as in the past) to replace the unfunded liabilities that are liquidated.

Ontario Northland has even higher costs, but has only 7 per cent of the employment in the Provincial utilities sub-sector.

The public sector study indicates that costs for the Provincial utilities sub-sector in the period 1973 to 1977 have been about 13.8 per cent overall. We have compromised and assumed that the employer cost will be 14 per cent exclusive of the indexing cost.

The Cost of Indexing Pensions

Pensions for public servants and teachers are indexed with the Consumer Price Index up to 8 per cent a year through the Superannuation Adjustment Fund. Hydro pensions have recently been increased 8 per cent every two years by amendments to the plan, that is, on a regular ad hoc system. OMERS and HOOPP pensions have been increased from time to time in the past, but no formal arrangements exist for future indexing.

Nevertheless it seems likely that augmentation of pensions to compensate for inflation will take place in all public sector plans, whether by ad hoc increases or SAF-type arrangements. We assume that indexing costs will be incurred in each of the five sub-sectors in this study.

The cost of indexing for public servants and teachers comprises three items:

- payments to pensioners who contributed to SAF;
- payments to pensioners who did not contribute to SAF;
- payments to pensioners under prior ad hoc pension adjustments.

The amounts under these headings in the years ending March 31, 1978 and March 31, 1979 are shown in Table 18.

Table 18
Indexing Costs, PSSF and TSF, 1978 and 1979

Year ending	March 31, 1979		March 31, 1978	
	(Thousands of dollars)	(Per cent of pay)	(Thousands of dollars)	(Per cent of pay)
Public Service Superannuation Plan				
Indexing from SAF	1,371	.11	444	.04
Indexing to SAF formula	11,946	.96	8,195	.67
Prior ad hoc augmentations	9,286	.74	9,633	.79
Total indexing payments	22,603	1.81	18,272	1.50
Teachers' Superannuation Plan				
Indexing from SAF	1,810	.08	599	.03
Indexing to SAF formula	24,312	1.02	16,433	.72
Prior ad hoc augmentations	18,190	.76	18,152	.79
Total indexing payments	44,312	1.86	35,184	1.54

Source Province of Ontario, Public Accounts.

As the government is paying 1 per cent of payroll to the SAF with respect to payments to SAF contributors, the cost to government for the year ending March 31, 1979 is 2.70 per cent for PSSF and 2.78 per cent for TSF. These figures reflect past inflation, which was low until about 1965, then started to rise and has been over 8 per cent per annum since 1973.

The value of a life annuity which increases at 5 per cent per annum is 44 per cent greater than a level life annuity for an employee retiring at age 65. On a pay-as-you-go basis, however, the ratio of indexed payments to level payments is considerably higher. This is because in the funded case the discounts for interest have most effect on the payments to be made at older ages, where the indexing additions are greatest. The indexing payments are in fact mostly pay-as-you-go, since the SAF has a relatively small and only temporary effect. Allowing for the economic assumptions, with inflation at 5 per cent per annum, the ultimate outgo for indexing is estimated to be 5.3 per cent of payroll. It should be noted that costs will be increased if the average retirement age is lowered.

Assuming that indexing in some form will be introduced in all sub-sectors, we consider that indexing will cost the employer some 3 per cent in 1980, rising to 4.3 per cent in 1995 in provincial government and education where employees contribute 1 per cent to the SAF. In municipal, health and provincial utilities, the cost is 4 per cent in 1980, rising to 5.3 per cent in 1995.

Summary

The following rates of contribution by employers to the pension plans are assumed:

	Regular plan	Indexing	Total
	(Per cent)	(Per cent)	(Per cent)
Provincial government	10.1	3.0 to 4.3	13.1 to 14.4
Municipal government	9.0	4.0 to 5.3	13.0 to 14.3
Health	7.7	4.0 to 5.3	11.7 to 12.3
Education	11.2	3.0 to 4.3	14.2 to 15.5
Provincial utilities	14.0	4.0 to 5.3	18.0 to 19.3

Projected Payrolls and Pension Costs: 1980-2005

Using the data and assumptions mentioned above, we estimate that payrolls for government employment will rise from $8.9 billion in 1980 to $84.9 billion in 2005, an almost tenfold increase. The number of employees will have doubled, and average salaries will be nearly five times their present dollar amounts. Inflation will have increased prices to three times their present level.

The rates of growth of provincial public employment and payrolls are faster than those of the Ontario work-force as a whole. Estimates made by the Commission as to the population of working age (20 to 64) will serve as an index of the Ontario work-force. Also the estimates of contributory earnings under the CPP for Ontario residents, while not including all earnings, provide some indication of general earned income.

	1980	2005	Per cent increase
Public service employment (thousands)	465	969	108
Ontario population 20-64 (thousands)	5,275	7,316	39
Public service payroll ($ billions)	8.9	84.9	854
CPP contributory earnings	37.8	281.7	645

Unfortunately, CPP contributory earnings, which have been used because no other estimates of total Ontario earnings are available, will for several years increase faster than such total earnings. The YMPE is rising at 12-1/2 per cent per annum, so that the contributory earnings comprise an ever larger percentage of total earnings. The YMPE will continue to rise at 12-1/2 per cent until it reaches the level of average earnings, probably soon after 1985 (depending on the inflation rate). If to exclude this transition period we examine the growth from 1985 to 2005, we find that the public service payrolls will grow by 490 per cent while CPP contributory earnings will grow by 330 per cent - showing a more accurate and more vivid contrast between public service payrolls and total payrolls in the province.

Pension costs to the employers in the Ontario public service are expected to rise in relation to public service payrolls as follows:

	1980	1985	1990	1995	2000	2005
Pension cost excluding indexing	(Millions of dollars)					
	916	1,479	2,340	3,563	5,469	8,432
Pension cost including indexing	1,221	2,036	3,329	5,260	8,129	12,598
Public service payroll	(Billions of dollars)					
	8.9	14.4	23.0	35.1	54.6	84.9
Cost as percentage of payroll:	(Per cent)					
excluding indexing	10.3	10.3	10.2	10.1	10.0	9.9
including indexing	13.7	14.1	14.5	15.0	14.9	14.8

Thus, pension costs for basic benefits will stay close to 10 per cent. The variations are primarily due to the different growth rates in different sectors, since we assume that the percentage of payroll

required in each sector for basic benefits will be constant. However, the indexing cost will rise as the system matures, and the total pension cost falling on the government as employer will rise from 13.7 per cent to about 15 per cent of payroll and then become roughly level (assuming no change in the benefits of the pension plans). It should be noted that these figures do not include contributions to the Canada Pension Plan or the cost of any other federal programs.

Pension costs in relation to total earnings of the Ontario population will rise, as indicated by the following comparison with CPP contributory earnings, which are a high proportion of all earnings.

	1980	1985	1990	1995	2000	2005
			(Millions of dollars)			
Pension costs excluding indexing	916	1,479	2,340	3,563	5,469	8,432
Pension costs including indexing	1,221	2,036	3,329	5,260	8,129	12,598
CPP contributory earnings	37.8	65.5	(Billions of dollars) 96.8	136.3	195.2	281.7
			(Per cent)			
Ratio excluding indexing	2.4	2.3	2.4	2.6	2.8	3.0
Ratio including indexing	3.2	3.1	3.4	3.9	4.2	4.5

Pension costs in relation to total earnings of the Ontario population will therefore rise substantially. It should be noted that the fall from 1980 to 1985 is spurious, being due to the rising YMPE of the Canada Pension Plan as mentioned above.

Table 19 shows the dollar amounts for the projected payrolls and pension costs.

Table 19
Payrolls and Pension Costs, Ontario Public Sector, Projections to 2005

	1980	1985	1990	1995	2000	2005
			(Billions of dollars)			
Estimated payrolls						
Provincial government	1.5	2.3	3.6	5.3	7.9	11.7
Municipal government	2.1	3.7	6.3	10.2	16.7	27.3
Health	1.1	2.0	3.6	6.1	10.5	18.0
Education	3.6	5.4	7.9	11.0	15.5	21.7
Provincial utilities	.6	1.0	1.6	2.5	4.0	6.2
Total	8.9	14.4	23.0	35.1	54.6	84.9
Pension Costs			(Millions of dollars)			
Provincial government	150	235	363	532	795	1,177
Municipal government	191	331	564	921	1,504	2,458
Health	85	154	275	472	810	1,388
Education	405	601	880	1,235	1,733	2,432
Provincial utilities	85	158	258	403	627	977
Total employer cost	916	1,479	2,340	3,563	5,469	8,432
Additional cost for indexing	305	557	989	1,697	2,660	4,166

Conclusions

The number of provincial public servants in Ontario is estimated to rise from 465,000 in 1980 to 969,000 in 2005. The increase is 108 per cent compared with a 39 per cent increase in the Ontario population of working age.

The annual cost of basic pensions (after deducting employee contributions and excluding indexing) will rise from nearly $1 billion in 1980 to $8.4 billion in 2005. This is the consequence of the increase in the number of public servants and a nearly fivefold increase in average salary, while prices will nearly triple in the period.

In addition, the cost of indexing pensions (taken as 4 per cent of payroll, rising to 5.3 per cent, the contributions being shared in the PSSF and TSF by the employee) will rise from $305 million to $4.2 billion. Such contributions are expected on our assumptions to cover the indexing cost on a pay-as-you-go basis until 2005 or later, but if inflation were greater or retirement age lower than in our assumptions, the Superannuation Adjustment Fund would be exhausted and the cost of this item would rise rapidly.

The five public employment sub-sectors have widely different characteristics and growth rates. The growth rates of employment assumed in our calculations are shown below, together with the projected 25-year increases:

Employment in	Annual growth	Increase, 1980-2005
	(Per cent)	(Per cent)
Provincial government	2.0	64
Municipal government	4.0	167
Health	5.0	239
Education	.75	21
Provincial utilities	3.0	109

The percentage of females varies remarkably between different government employments - from 14 per cent in Provincial utilities to 79 per cent in the health sub-sector. Overall the public service employment is 45 per cent female, compared with 40 per cent in the Ontario work-force.

The rates of termination of employment appear to be quite low in the education and utilities sub-sectors and much higher in the provincial, municipal and health sub-sectors.

As a result of the different growth rates and termination rates, it is expected that the average age will fall in provincial and municipal and health service, will be stable in utilities and will rise in education. The cost in each sub-sector is based primarily on the major

provincial pension plan in each case (i.e., PSSF, OMERS, HOOPP, TSF and Hydro).

It is not possible to predict the trend of cost as a percentage of payroll from the actuarial information available; we have therefore assumed that basic plan costs will be constant percentages. The employer cost as a percentage of payroll is taken to be:

	Basic pension cost	Ultimate indexing cost
	(Per cent)	
Provincial government	10.1	4.3
Municipal government	9.0	5.3
Health	7.7	5.3
Education	11.2	4.3
Provincial utilities	14.0	5.3

The overall pension cost, including indexing as above (and weighted for the sub-sectors) is expected to rise from 13.7 to 14.8 per cent of payrolls. In relation to the overall earnings of Ontario workers, the rise will be even steeper; as a percentage of CPP contributory earnings it will rise from 3.2 to 4.5 per cent in the 25-year period.

NOTES

(1) R.M. Skinner, Accounting Principles, Toronto; CICA, 1972, quoted in Accountants International Study Group, Study No. 18, Accounting for Pension Costs, 1977.

(2) R.M. Skinner, Pension Accounting, Toronto, 1980, Clarkson Gordon, p. 12.

(3) Accountants International Study Group, Study No. 18, paragraph 12.

(4) Ibid., paragraph 24.

(5) Tomenson-Alexander Associates, Report on Certain Aspects of the Public Service Employee Pension Program, 1977, p. 68.

LIST OF TABLES

Table 1 - Early Retirement Pensions, Value at Various Ages of Commencement with and without Subsidy 132

Table 2 - Six Public Sector Pension Plans in Ontario, Assets, Actuarial Liabilities, Unfunded Actuarial Liabilities 135

Table 3 - Restated Assets, Actuarial Liabilities, Unfunded Actuarial Liabilities of Six Public Sector Pension Plans in Ontario 137

Table 4 - Total Annual Pension Costs to Selected Employers Including Past Service Cost and Experience Deficiency Write-Off as Percentage of Salary and Wages, Canada 145

Table 5 - Employer's Payments into Pension Plan as a Percentage of Pension Payroll, 1977 - Six Plans, Ontario Public Sector 145

Table 6 - Total Payments into Pension Plan as a Percentage of Pensionable Payroll - Six Plans, Ontario Public Sector and FEI Study Average 146

Table 7 - Provincial Government Employment and Population, 1961-1976 (showing number and annual percentage growth rates) 159

Table 8 - Growth of Employment in Ontario Public Sector (showing number and annual percentage growth rates) 160

Table 9 - Population of Ontario, 1975-2005 161

Table 10 - Age Distribution of Employees, Ontario Public Sector, December 1977 165

Table 11 - Five-year Survival Factors, Showing Probability that an Employee at a Given Age Will Still be in Service Five Years Later - Ontario Public Sector 167

Table 12 - Termination of Employment Rates from Actuarial Reports, Ontario Public Sector 168

Table 13 - Estimated Average Retirement Age 170

Table 14 - Entry Ages of New Employees, Ontario Public Sector 171

Table 15 - Estimated Number of Employees, Ontario Public Sector Employment by Sub-sector, 1980-2005 173

Table 16 - Age Distributions, Ontario Public Employment by Sub-sector, 1980 and 2005 174

Table 17 - Salaries by Age Group, Ontario Public Employment, by Sub-sector - Dollar Average and Percentage of Average for All Ages 190

Table 18 - Indexing Costs, PSSF and TSF, 1978 and 1979 182
Table 19 - Payrolls and Pension Costs, Ontario Public Sector, Projections to 2005 186

Chapter 6

Other Public Sector Pension Issues

COLLECTIVE BARGAINING OF PENSIONS

There are 94 unions representing approximately 373,000 members of pension plans in the Ontario public sector out of a total of approximately 450,000 employees covered by pension plans. The unions range in size from the Ontario Teachers' Federation, representing 105,000 members, to the Sheet Metal Workers Union, representing two members. Twenty-four of the unions represent 500 or more employees.

Formal bargaining on pensions is not general practice in the Ontario public sector. Plans that are subject to bargaining (generally for both union and non-union employees) are:

- Hydro Pension Plan
- London and Ottawa Transit Commission plans
- Ontario Northland Transportation Commission plans
- Staff plans in some universities
- Faculty plan in York University
- Closed municipal plans: Metro Toronto
  Metro Police
  Borough of York
  City of North Bay

In a few cases pensions are excluded from the scope of collective bargaining directly or indirectly as a result of legislation. The Crown Employees Collective Bargaining Act, which covers many members of

the PSSF, expressly excludes pensions from the scope of bargaining; however, it states that the governing principles should be subject to review by the employer and the bargaining agent). The OMERS Act, which defines the terms, conditions and benefits of the plan, allows for the negotiation of only specified supplementary benefits. The Teachers' Superannuation Act makes no reference to collective bargaining. In effect, the provisions of these plans can be altered only by negotiation with the government as opposed to the immediate employer.

HOOPP would appear to be theoretically bargainable. However, the various unions in the health sector do not have representation in all member hospitals. Even if they did, they could not realistically negotiate the provisions of the plan unless they were to bargain jointly. The same problem would exist in the PSSF, TSF, and OMERS if it were possible to negotiate the provisions of these plans, since all are multi-employer or multi-union plans. In a few cases, notably in a number of universities, it would appear that pensions are not negotiated because unionized employees constitute a minority of the plan's members.

Most unions have expressed the view that pensions should be negotiable, on the ground that employer contributions to pension plans represent employee income in the same way as salaries or other benefits, and that it is anomalous that they should be able to bargain on all items of compensation except pensions.

The Canadian Union of Public Employees (CUPE), in its brief to the Commission, made several recommendations on this point. It proposed:

- that the Ontario Pension Benefits Act be amended to recognize bargaining agents as the legal representatives of employees with regard to pension matters;

- that legislation be amended to establish mandatory joint pension boards of trustees or administrative boards with an equal number of representatives of employees and unions where one or both parties so desire; and

- that relevant legislation be amended to give unions the right to negotiate for retired employees.

CUPE stated that public sector unions to date had shown very little interest in the area of pensions, but this would not continue in the future, and more stress would certainly be put on pensions. CUPE recommended co-management as the appropriate way to administer contributory plans. It pointed out that New Brunswick currently had a 50-50 representation in the administration of its plans. With regard to pensioners, CUPE noted that under the Ontario Labour Relations Act the employer was not required to negotiate with the union on behalf of retired employees. However, CUPE had moved to maintain union membership

for retired employees, and the constitution of the union now recognized their rights. Changes in the law were required to uphold these rights.

The Ontario Public Service Employees Union (OPSEU) regarded as "absolutely unacceptable" the fact that employees covered by the Crown Employees Collective Bargaining Act and the Colleges Collective Bargaining Act were not allowed to negotiate pensions. The union maintained that employer contributions towards pension benefits are simply redirected wages and, accordingly, workers had a right to the entire assets of pension funds. Its recommendations were:

- that separate pension funds be created for bargaining unit employees in the public service and in the colleges of applied arts and technology and turned over to OPSEU, which would nominate the trustees and administrators and negotiate the rate of employer contributions;

- that hospital pensions be negotiated by an employer council and an employee council composed of bargaining agents representing hospital employees; control of HOOPP would be considered during negotiations; and

- that legislation be amended to permit OPSEU to negotiate for retired employees.

While OPSEU wished to control the pension plan and accept responsibility for the fund, it would not accept responsibility for accrued liabilities which occurred due to mismanagement by the employer. How these should be liquidated and by whom would be a matter of negotiations between the union and that employer. There was a precedent for this type of arrangement, it said, in the construction and garment industries. The manner of liquidating experience and actuarial deficiencies would be negotiable with the employer.

The Ontario Nurses Association (ONA) recommended that there be legislation to provide a formal means for employee input into pension fund management, funding, and planning. The union stated that, although HOOPP was theoretically bargainable, employees had no say in the plan whatever. The ONA bargains on a local basis, but pensions are on a provincial basis. According to ONA, the individual hospitals had no say in HOOPP since it was controlled by the Ontario Hospital Association. It was possible, however, to bargain for pensions in those hospitals which had separate plans.

The Ontario Provincial Police Association (OPPA) stated that it was only in the last 3 or 4 years that there had been some consultation with the government about pensions. Government, it said, had not been unsympathetic to the association's concerns. However, the OPPA felt that the government had not fulfilled its role in ensuring equitable treatment for provincial police officers. In the absence of the

opportunity to negotiate pensions, it was the responsibility of the government, as employer, to see that retirement provisions for the OPP were comparable with those in other Canadian police forces.

The Ontario Teachers' Federation (OTF) did not see a need for formal collective bargaining on pensions. In a sense, it said, it goes through collective bargaining with the Ministry of Education. Discussion of pensions at the local level would create chaos. In the future there would be a need for consistency across the public sector, and any kind of local negotiations would be completely against that trend.

There are a number of reasons behind the employers' view that public sector plans should not be negotiable:

(i) the complexity of final average plans, which would make bargaining of pensions very difficult;

(ii) the likelihood that bargaining would result in fragmentation of plans;

(iii) the possibility that each bargaining unit would attempt to obtain the best features of other plans, making it difficult to control costs; and

(iv) the view that it is the employer's responsibility to ensure that former employees have an adequate retirement income.

A number of comments should be made about these points in order to permit some conclusions to be drawn about their significance.

First, with regard to the complexity of the subject, while bargaining over final earnings plans is not unknown (Ontario Hydro is a case in point) bargaining usually takes place in flat benefit plans where the benefit is a dollar amount per year of service and the plans are non-contributory. (The only public sector plan in that category is one at McMaster University). Negotiation of a final earnings plan is said to be more difficult, since the costing of such plans is a more complex process. Perhaps the key issue here is whether the complexity associated with final earnings plans means only more difficult negotiations or whether it would be likely to result in settlements that are contrary to the public interest. The answer to the latter question might be largely dependent on how the parties handled deficiencies resulting from underestimates of costs.

The view that collective bargaining might result in fragmentation of pensions was expressed by Jacob Finkelman in his Report on Employer-Employee Relations in the Federal Public Service (1974). In recommending that the Federal Superannuation Plan should continue to be excluded from the scope of bargaining, Finkelman stated that the establishment of a

separate plan for each bargaining unit would seriously inhibit mobility within the public service, and that this would also jeopardize accrued entitlements as well as the actuarial soundness of the funds. He added, however, that some form of coalition bargaining might be possible, though this would require further study.

The negotiation of public sector plans in Ontario would undoubtedly result in some degree of increased fragmentation if only because it might be necessary to have separate plans for bargaining unit and excluded employees. Whether it would result in more fragmentation than that would depend on the approach that was taken to bargaining. For example, some form of coalition bargaining, as mentioned by Finkelman, might be a solution to the negotiation of major plans in which there are a number of unions (and in some cases many employers). Such an approach was proposed by OPSEU, which has a few bargaining units in hospitals, as a way to make bargaining of HOOPP more than a theoretical possibility. Specifically, it recommended in its submission to the Commission that the HOOPP plan be negotiated between a council of unions and an employers' council. How practical such an approach might be (including how acceptable it would be to all of the parties involved) is a question that would require more study.

The third argument mentioned for excluding pensions from the scope of collective bargaining was the view that unions would attempt to negotiate for themselves the best features of other plans, and that would result in an escalation of pension costs. This would appear to be the strongest argument for excluding pensions from the scope of negotiations. However, since bargaining would cover all items of compensation, it might just as easily be argued that the negotiation of pensions would force unions to recognize trade-offs that are involved among salaries, pensions, and other benefits. Indeed, the greater danger may be that some unions, particularly those with a young membership, might not give sufficient emphasis to pensions.

The latter point is related to the view that it is the employer's responsibility to ensure that former employees have an adequate retirement income. An employer's image may be adversely affected if long-service employees do not have adequate pensions. Whether or not employers are more likely than unions to be concerned about the adequacy of pensions for all employees is a question that relates generally to issues of adequacy and pensioner representation.

Alternatives to Collective Bargaining

Employee Control of Pensions

OPSEU was the only union to ask for control of pension plan funds and administration. Although there may be a theoretical case for this, no single employer in either the private or the public sector as yet has handed over a pension plan to a union. Multi-employer plans - which are

administered by boards of trustees appointed by unions and management - may be distinguished, since the liability of participating employers is limited to a cents-per-hour contribution.

A basic question to be considered is whether it is desirable that pension benefits should be contingent on membership in a particular union or bargaining unit. Aspects that would have to be considered include union membership policies (e.g., circumstances in which employees might lose their membership in the union, the feasibility of ensuring portability) and any union guarantee of benefits. Employee control would also have to be considered in conjunction with the issue of uniformity, an aspect which is discussed later.

Limited Bargaining

The OMERS plan, which permits negotiation of supplementary benefits, is a model which could be adapted to other plans. This approach would ensure a certain level of pension protection for all employees while permitting those who feel that they have special needs to negotiate better or different provisions. How far this might go to meet union concerns about pensions would depend on the nature of the basic plan provisions and the range of options made a subject for bargaining.

Joint Consultation

With the exception of the Hospitals of Ontario Pension Plan, which does not provide for consultation with employee representatives, most public sector plans provide for some form of consultation with employee representatives:

Teachers' Superannuation Fund - The Teachers' Superannuation Commission, which administers the fund, is composed of management and union representatives. Pension issues are discussed by the Minister of Education with the Ontario Teachers' Federation.

Public Service Superannuation Fund - There is one union representative on the four-member Public Service Superannuation Board, and provision is made for a joint commission with representatives from management and employees to discuss pension issues.

Ontario Municipal Employees Retirement System - There are four union representatives on an 11-member board. While the basic OMERS plan is not negotiable, employees of each municipality may negotiate with their employer whether or not they will join two supplementary plans which are offered by OMERS, and the extent of the employer's subsidy to the supplementary plan.

The Toronto Transit Commission Plan provides for a joint committee of management and union representatives to deal with pension issues.

The Workmen's Compensation Board Plan provides for informal consultation.

The pension plans at universities are subject to consultation between faculty and management representatives.

The Colleges of Applied Arts and Technology Plan provides for consultation with employee representatives, as do most of the small plans in the public sector.

Even with collective bargaining, there would be advantages to having regular consultation between employers and employee groups on pension matters. This could be a means to involve pensioners in discussion of matters affecting them. (No plan presently provides for inclusion of pensioners in joint committees.) Whether or not joint consultation could be considered a meaningful alternative to collective bargaining depends on the extent to which individual unions feel they can influence policy through this process. Some unions obviously believe that existing mechanisms are not sufficient. On the other hand, the teachers appear to be satisfied with the present system of direct consultation with the Minister of Education.

Joint administration of pensions may be considered an extension of joint consultation, and in general this is an area in which management and unions have co-operated successfully (e.g., the Public Service Superannuation Board, the Teachers' Superannuation Commission, the OMERS Board).

A problem that may arise in cases where employees are represented by more than one union, is that of determining the number of representatives each union will have on the board. In addition, there may be a need to provide employees with some form of appeal procedure from decisions of pension boards.

While the Commission favours the principle of collective bargaining, formal or informal, between employers and employees to determine pension benefits, it is not prepared to recommend any move to extend formal collective bargaining in the public sector at this time. The first priority for the government in relation to public sector pensions is to establish cost controls. To permit more collective bargaining before a control structure such as that recommended by the Commission is operating effectively would only lead to greater costs, which in turn would encourage those who favour a move to a defined contribution system. In any case, union participation is not just a matter of removing prohibitions of collective bargaining from the legislation. A satisfactory system of representation of all parts of the bargaining unit, through coalition bargaining or a similar joint arrangement, would have to be worked out before collective bargaining could operate fairly for all members of the bargaining unit and those excluded. It may also be that fragmentation makes any type of collective bargaining

impossible. To the extent that these problems cannot be satisfactorily resolved, pension matters should continue to be excluded from collective bargaining.

The Commission therefore recommends:

> That pensions be considered as appropriate for collective bargaining in the public sector, subject to the acknowledgement that there may be some circumstances in which collective bargaining may not be practicable, and that no new areas for collective bargaining of pensions be opened at this time.

PENSIONER REPRESENTATION

Both CUPE and OPSEU maintained that changes should be made in labour legislation so that unions could bargain on behalf of their retired members. However, representatives of the two pensioner organizations with whom Dr. Kelly met - the Ontario Municipal Retirees Organization and the Hamilton Civic Hospitals Quarter Century Club - were sceptical about the ability of unions to represent the interests of all pensioners, and maintained that there was a need for separate pensioner representation. Both groups felt that changes to pension plans often favoured active employees at the expense of retirees.

Members of OMRO receive pensions from OMERS and also from Confederation Life (the latter a closed plan for employees of municipal utilities) and changes had been made to both of these plans without input from or even notice to the affected pensioners. Specific concerns of OMRO were an announcement by OMERS that regular increases for pensions would be discontinued following the introduction of a final average earnings plan, and the decision to grant a 50 per cent survivor clause to active members of the Confederation Life plan while giving retired members a 15 per cent increase in pensions. More generally, OMRO was critical of the lack of information provided to pensioners.

As far as can be determined, pensioners are not represented at the present time on the board of any public sector pension plan, nor do they have any other formal say in decisions affecting them. In assessing whether or not they should have such representation, there are several questions to be considered:

- What would be the object of such representation? Would it be primarily to lobby for pension improvements? If so, is this a form of representation to which pensioners should be entitled as a matter of right? Are there other useful purposes that could be served?

- How effectively could pensioners represent themselves? There appear to be few public sector pensioner organizations, though

the Superannuated Teachers of Ontario and the Ontario Municipal Employees Retirement Organization represent pensioners of two of the major plans. Assuming that pensioners were more highly organized, could they realistically expect to have an effective voice in decisions?

Although a number of unions have maintained that they should be allowed to represent pensioners, Ontario labour legislation (or the interpretation that has been given to it) does not permit unions to bargain on their behalf. British Columbia appears to be the only jurisdiction in which such representation is possible. Employers take the position that unions cannot represent former employees, while some pensioner representatives have also suggested that unions are not appropriate organizations to represent them. First, not all pensioners are former union members. Secondly, they feel there may be a conflict of interest between union members and pensioners; that is, unions may emphasize wage increases rather than pensions. Even in matters of pensions there could be a conflict of interest between the active employees and the retired employees. For example, active employees might seek a final average formula, while the retired might wish to have indexing of pensions (as in OMERS).

The views of the Commission on pensioner representation are the same for the public sector as for other plans. It is not convinced that pensioners as a group have any rights for representation except where necessary to protect those rights to which they become entitled at retirement. If the Commission's recommendations for the full protection of retirees' benefits on a wind-up basis are adopted, the Commission can see little need for representation. The negotiation of better rights after retirement is a completely different matter, and the Commission sees no need to compel employers to provide representation for this purpose - either directly to pensioners or indirectly through the union.

The Commission does find, however, that lack of communication between employers and pensioners may have created a desire for representation as a means to obtain information. Employers might well consider more, and more timely, disclosure to pensioners as a response to the demand for representation.

RECIPROCAL TRANSFER AGREEMENTS

Reciprocal transfer agreements as providers of increased portability are discussed generally in Volume II, Chapter 8. The more frequent use of these agreements in the public sector than in the private sector is attributable to the homogeneity of employers within the transfer group. The agreements are primarily between Ontario public sector employers and between the Ontario public sector and that of other jurisdictions in Canada. There are few agreements between the public sector and the private sector.

Legislation under which major public sector plans in Ontario were established permits them to enter into reciprocal transfer agreements with other public jurisdictions. Some plans not governed by specific legislation also provide for transfer agreements. Major plan provisions are as follows:

PSSF: Agreements with the government of Canada, most provinces, and the major pension plans in the Ontario public sector.

TSF: Agreements with the government of Canada, the PSSF, the CAAT Pension Plan, and teachers' plans in other provinces.

OMERS: Agreements with the government of Canada, PSSF, CAAT, and one province.

HOOPP: Agreements with the government of Canada, PSSF, CAAT, and five hospitals.

Hydro: Agreements with the government of Canada, PSSF, OMERS, and two provinces.

Under reciprocal agreements, double contributions with a nominal rate of interest (ranging from 3 to 5 per cent) are transferred from one plan to another. If the amount transferred is less than the receiving plan requires, the employee has the option of purchasing up to the full pension service credit earned in the exporting plan.

The university plans provide for few reciprocal agreements, but most plans allow for the transfer of double contributions plus the fund rate of interest to another employer's plan or to an RRSP, provided that the contributions are locked-in. The exception is Trent University, which appears to permit a transfer of double contributions without locking-in, or a refund of double contributions (subject to the Pension Benefits Act).

A separate aspect of portability is the case where the government decides to move certain programs from one area to another in the public sector. A variety of bases have been used for the calculation of pension transfer values in such cases.

Transfers

Although it is not possible to show how many persons moved from one public sector plan to another in 1977, it is clear that, relative to total terminations, little use is made of the opportunity to transfer double contributions from one plan to another. For instance, there were 4,302 terminations from the PSSF in 1977 (excluding retirements). During the same period, there were 106 transfers under reciprocal agreements. Some 280 university employees took advantage of the option to transfer double contributions to RRSPs or other plans.

Table 1
Ontario Public Sector, Transfers Into and Out of Plans with Reciprocal Agreements, 1977

Sub-sector	Into plans	Out of plans
Provincial government	140	132
Municipal government	17	78
Health	60	30
Education		
Teachers	10	12(a)
CAAT	91	42

a 1976.

Source Royal Commission on the Status of Pensions in Ontario, "Ontario Public Sector Employee Pension Study Data."

In addition to transfer arrangements for employees who voluntarily terminate their employment, arrangements have also been made to ensure portability of pension rights when employees have involuntarily terminated their membership in a plan as a result of programs being moved from one area to another in the public sector. Ten major transfers, listed below, took place between 1966 and 1978. For some employees, the basis on which the transfers were arranged was less favourable than would have been the case had they transferred under reciprocal agreements, while for others the opposite was the case.

Transfers into the PSSF from other Funds

- Metro Juvenile and Family Court - 1966 : 125 employees
- Administration of Justice - 1968 : 2,000 employees
- Property Assessors - 1970 : 2,000 employees
- Water Resources - 1972 : 400 employees
- Ontario Housing Corporation - 1976 : 1,000 employees

Transfers from the PSSF to other Funds

- University of Guelph - 1965 : 800 employees
- Colleges of Applied Arts and Technology - 1967 : 700 employees
- Hospitals of Ontario Pension Plan - 1977/78: 420 employees

Others

- Nursing schools from HOOPP to CAATs - 1973 : 800 employees
- Hydro to OMERS (Municipal restructuring of Hydro) commenced in 1977, should eventually cover: 500 employees

Some criticism was expressed of the operation of existing reciprocal transfer agreements. The Ontario Nurses Association stated that while there is portability within HOOPP, there is no portability for employees of independent hospital plans. Nurses who transfer to or from one of these hospitals lose their pension credits if they are not vested. Problems are found in HOOPP, which has only limited portability within the public sector. More fundamentally, while many nurses put in long years of service, few have the unbroken service that is required to build up pension rights under current vesting regulations.

The OPPA noted that while members could go to municipal police forces and transfer their pensions to OMERS, not all smaller police forces qualified. In addition, pensions are not transferrable to plans in other areas of employment to which police might move, such as a security company. Dean E.F. Baumert, Northern College of Applied Arts and Technology, suggested that it should be possible to provide for country-wide portability which would enable public sector employees to move freely from one province to another. Some individuals outlined specific problems relating to their own pension entitlement; these problems stemmed from two aspects of existing reciprocal mechanisms:

(i) the requirement that a person who joins the Ontario public service from an organization with which it has a reciprocal agreement must do so within 3 months of leaving the previous employer; and

(ii) the fact that transfer arrangements do not cover employees who moved to the public service prior to the retroactively established date.

In the first case, it was maintained that the three-month requirement was unduly restrictive, given the length of time that may elapse between termination of employment and the start of new employment. In the second case, it was suggested that the retroactive date should have been extended further back.

While the Commission generally favours any practice which has the effect of increasing true portability, one of its prime concerns for public sector plans is cost. Reciprocal transfer rights are one of the benefits noted in the list of especially desirable features for comparison with the private sector in the chapter on public sector costs. There is no doubt that reciprocal transfer agreements result in higher costs for the public sector employer. Any extension of reciprocal rights should be considered carefully from the cost point of view.

Sometimes the agreement may operate to provide a better result for transferring employees than for those who stay. For example, most university plans allow for the transfer of double contributions plus the fund rate of interest, either to another employer's plan or to an RRSP, provided the contributions are locked-in. Up to about age 45, double

contributions might provide for higher benefits than those promised in any defined benefit plan for each year of service, but for older employees they would fall increasingly short of purchasing the promised benefits. Thus, a younger person who moved to another plan and for whom double contributions were transferred to an RRSP in respect of service with the previous employer might end up with a higher pension than would have been received had the employee been employed continuously with either one for the same number of years. For an older employee, the opposite might be the case.

Some plans, in connection with reciprocal transfer rights, provide an option for the employee to buy back past service credits in the receiving plan. Again, the Commission has no objections if these rights are properly costed and the cost fairly allocated between employer and employee. Some agreements, for example, may operate to allow an employee who transfers into the plan to obtain inflation protection under the Superannuation Adjustment Benefits Act for pension service accrued in a plan in which no such protection was provided. Such benefits should only be provided at a suitable cost to the transferring employee.

The Commission therefore recommends:

> That the terms of reciprocal transfer agreements for public sector employees be reviewed and, where necessary, be altered to result in neither undue gain nor undue loss to the person making a transfer from one plan to another and to ensure that the cost of additional benefits which become available upon transfer, such as improved benefits for past service with other plans, are fairly allocated between the employer and the employee.

PENSIONS FOR PROVINCIAL JUDGES

Ontario has legislative jurisdiction over the pensions of 191 provincial court judges and 8 small claims court judges. At present, pensions for these judges are governed by the Public Service Superannuation Act. Judges contribute 7 per cent (less CPP contributions) to the PSSF, as do provincial civil servants. The pension formula is a 2 per cent, five years' highest earnings formula, to a maximum of 70 per cent integrated with CPP benefits. Cost-of-living adjustments are made annually, based on increases in the CPI, to a maximum of 8 per cent. Survivors are eligible to receive half the pension entitlement if the plan member is vested; if not, the survivor is entitled to twice the member's contributions plus interest. Normal retirement age is 65. However, as with other PSSF members, judges may retire at age 60 with an unreduced pension, providing they have 20 years' service or their years of age and service equal 90. The salary of a provincial court judge is currently about $52,000.

Submission of the Judges

The Provincial Court judges are seeking improved pension benefits and a plan separate from that of public sector employees. They submit that independence of the judiciary requires financial security both while on the bench and in retirement, and that a special status in pension matters is therefore needed that cannot be fulfilled by membership in the public service employees' plan.

The principle is well established that the judiciary, as one of the three branches of government, should have separate status if it is to remain independent and free from undue influence. In an address to the Meeting of Commonwealth Law Ministers on August 23, 1977 in Winnipeg, Chief Justice Bora Laskin of the Supreme Court of Canada said,

> "The extent of the separation will reflect the significance which the political authorities attach to adjudication and to the role of judges in the interpretation and application of the law."

The Provincial Judges Association believes:

> "...that an adequate pension or annuity such as is enjoyed by the federal judges, is a support that must be provided, in order to maintain the independence of the Provincial judges, and if the said support is lacking, the result is an outside pressure that could threaten the independence of the judiciary."

If institutional traditions that assist the judiciary in the development of adjudicative law are to develop, the judiciary must have its own exclusive framework within which to grow. The judiciary, although not independent of the structure of government, must have independence of function within that structure. The salaries and pensions of federal judges are fixed by Parliament as required by section 100 of the BNA Act.

The judges urge implementation of a separate pension plan pursuant to the Provincial Courts Act, which provides that the Lieutenant-Governor in Council may make regulations providing for the benefits to which judges are entitled, including "pension benefits for judges and their widows and surviving children, and for the transfer or other disposition of benefits in respect thereof to which persons appointed as Judges under this Act were entitled under the Public Service Superannuation Act at the time of their appointment under this Act" (Section 28(1)). This provision was enacted after the McRuer Report on Civil Rights which recommended that the salaries of magistrates be equated to those of county court judges. In 1973, the Ontario Law Reform Commission observed that the Provincial Courts Act clearly contemplated a separate scheme of benefits for provincial judges. It recommended that pension benefits be provided on a non-contributory basis as they are for federally-appointed judges.

It was argued by His Honour Judge V.K. McEwan on behalf of the judges, that the provisions in the Provincial Courts Act require the plan for judges to be constituted under that act, although the wording of the act is permissive in form. It is also doubted that judges are "civil servants" or "crown employees" or "public servants" as defined in the PSSA. His argument is supported by the reasoning in Landreville v. The Queen.(1)

Special status is also urged having regard to the "second career" nature of judicial duties. In 1970 the average age of appointment to Provincial Court (Criminal Division) was 44 years. The maximum number of pensionable years of service is 21, and the PSSA plan would yield a pension of 40 per cent of the average of the five highest years of salary. The judges pointed out in their brief that their pension benefits were poorer than those of provincial judges in any other province except Nova Scotia.

The judges are seeking pension benefits similar to those provided for members of Ontario's Legislative Assembly under the Legislative Assembly Retirement Allowances Act (LARA). The current compensation of MLAs is $22,000 plus an $8,000 expense allowance. They contribute 8-1/2 per cent of salary, and the unit of benefit is 4 per cent for the first 10 years and 3.5 per cent for the next 10 years up to a maximum of 75 per cent based on the average of the highest 3 years' salary. The government does not pay CPP contributions; accordingly, the CPP benefit is stacked. There is no provision for automatic indexation of retirement benefits, but there have been three ad hoc adjustments to date. Full accrued pension benefits are payable when age and service equal 55 after a minimum service of 5 years. The survivor pension is 60 per cent, plus 10 per cent for each child to a maximum of three.

In 1978 the judges asked for the same pension benefits as members of the Legislative Assembly but with the same indexing as public servants. Their present objective is a benefit which accumulates at a slightly lower rate than provided for under LARA; i.e., they would accumulate 70 per cent of salary in 21.5 years, while LARA members accumulate 75 per cent of salary in 20 years. However, the judges ask for automatic indexing which, in their case, would increase the liability by approximately 50 per cent assuming automatic indexing at 5 per cent each year. The judges also wish to pay lower contributions than members of LARA (7 per cent of salary instead of 8-1/2 per cent).

Actuaries for the government have calculated liabilities for judges' pensions (based on 155 judges - now 191) as follows:

	Total liability (Millions of dollars)
1. Judges' existing benefits under the PSSF	
a) With no indexing	
Retirement at age 70	23.7
Retirement at age 65	25.4
b) With indexing	
Retirement at age 70	34.7
Retirement at age 65	39.4
2. IARA benefits applied to judges amended as of August 29, 1979	
a) With no indexing	
Retirement at age 70	36.4
Retirement at age 65	43.1
b) With indexing	
Retirement at age 70	54.3
Retirement at age 65	67.8

Members of the Legislative Assembly receive the same insurance benefits as civil servants: life insurance, long-term disability insurance, medical insurance, and dental insurance. Judges also receive these benefits. However, judges now participate in other public service benefits, the most costly of which is attendance gratuity/severance pay.

Conclusion

The Commission agrees with the submission of the judges that the independence of the judiciary requires the enactment of a pension plan for judges separate from that of civil servants and so recommends. Such a plan should be subject to the Pension Benefits Act.

Similarly no issue was taken with the separate plan for MPPs, and the Commission supports the separate plan for MPPs provided it is subject to the requirements of the Pension Benefits Act. We support such separate plans not because of the short-service nature of the respective duties or the special nature of the careers, but rather as a corollary of the separation of judicial, legislative and executive powers of government.

Our recommendation applies to all members of the judiciary. Justices of the Peace Harold J. Gibson and Ralph E. Faulkner (Brief 396), submitted that Justices of the Peace are members of the judiciary rather than public or civil servants. The Attorney General should be requested to determine this matter of legal status. All members of the judiciary to which Ontario's legislative powers apply should then be members of the same plan.

It is not the function of this Commission to recommend the terms of plans. That is best left to negotiation between the judges and the government, and to the Legislature.

PENSION PARITY

The question of pension parity for public sector employees has three general aspects:

1. Parity with the private sector plans

This matter is discussed in detail in the chapter on cost. The Commission endorses the principle that parity is desirable (assuming some reliable method of comparison) and that the government, as employer, should not lead the way. Some of the Commission's recommendations - that all public sector plans should be explicitly subject to the Pension Benefits Act; that all benefits must be funded in an established fund; and that investments must be through the private capital markets - should assist in a movement towards parity between public sector and private sector plans. Some of the following discussion relating to parity among Ontario's public sector plans is also affected by the course taken in the private sector.

2. Parity between Ontario public sector plans and those of other jurisdictions

Chapter 2 contains a comparison of the main provisions of both the PSSF and the Legislative Assembly Retirement Allowances Account (LARA) with those of comparable plans in other jurisdictions. These comparisons reveal a good deal of similarity in pension benefits provided by the various jurisdictions in Canada. There is no doubt that the design reflects a movement towards parity not so much to facilitate mobility among the jurisdictions as the desire to obtain the best benefits possible. This approach is borne out by the brief of the Ontario Provincial Police Association (Brief 183) in which part of the argument was based on a survey comparing the retirement age and benefit provisions under federal, provincial and municipal plans for major police forces in Canada. While no jurisdiction has a single plan covering all public sector employees, the federal government and Quebec government plans have a much wider range of membership than does the PSSF, while in some

other jurisdictions there appears to be a high degree of uniformity of benefits among different plans. It appears, too, that efforts are being made in some provinces to bring about greater equalization of benefits.

The Commission sees a natural movement towards parity among the various jurisdictions in Canada but, given the differing conditions of employment in each jurisdiction, it makes no recommendation that the government should take steps to hasten this movement.

3. Parity among Ontario public sector plans

Views expressed to Dr. Kelly and in briefs to the Commission on the subject of parity of public sector pension plans were mixed. There was a fairly widespread view that greater uniformity would be desirable. Yet many felt that their own particular group had special needs which might not be met effectively under a completely standardized approach.

CUPE, for example, indicated that it would like to see uniformity in terms of benefits, negotiations, and administration; and OPSEU expressed a similar view. A merging of plans, the latter added, should be a long-term objective, not to be attempted until standards had been brought up to the same level. In CUPE's opinion, the Colleges of Applied Arts and Technology (CAAT) plan, for example, was poorer than the PSSF. Some had indexation, others did not. The same contributions did not provide the same benefits in each plan. Although in favour of greater uniformity, OPSEU stressed that there should be separate plans for bargaining unit and other employees.

The OTF stated that it would go along with some similarity of pensions within the public sector, but it would not support any hard and fast uniformity because the situation of teachers was different. For example, they stay in the profession for a long time and for that reason have excellent service linkage and reciprocal agreements within the teaching profession. Employees in other public sector areas might not see those features as important.

Most other comments on this issue came from university employee groups and these largely centred on whether there should be greater uniformity among university plans rather than on whether there should be more uniformity with other areas of the public sector. A number of briefs pointed out aspects of disparity among the plans. These are outlined in Chapter 2. Readers are also referred to the detail of major plan provisions for each sub-sector set out in Volume VII.

While many of the differences among the plans are minor and probably reflect circumstances at the time the plan was introduced and the nature of the employment group covered, there are some areas of general interest to be addressed.

Adequacy

Over 95 per cent of members are in plans in which the basic benefits are calculated on a final or best average formula. Many of these plans have a 2 per cent per year accrual rate. This type of plan is acknowledged to provide the best benefits of those generally available. Complaints of inadequate pensions, therefore, result not from the benefit formula but rather from the effect of short service accruals under the plan. This problem, dealt with extensively in Volume II, affects employment pensions generally and not just pensions for public sector employees. If the mandatory plan recommended by the Commission is adopted, a basic level of protection will be created. The public employee supplementary pensions should then be assessed by the government on the net replacement ratio method to determine a suitable level of benefit accrual. These levels are the subject matter for discussion between government employers and their employees, but must be considered against the background of cost and parity with the private sector. For example, the teachers who now have a seven-year averaging would like to move to five-year averaging. The additional cost should be considered in the light of total benefits under the teachers' plan.

Indexing

Cost is a limiting factor for indexing of retirement benefits. The Commission has recommended the funding of indexing in accordance with proposed amendments to the Pension Benefits Act, and repeal of the Superannuation Adjustments Benefits Act. If indexed benefits are to continue to be promised as at present the cost must be shared between employer and employee in some manner that recognizes the whole cost. This is not to say that indexing should not be extended to those public sector plans which do not now provide indexing (OMERS, HOOPP among the major plans) but rather that the benefit must be funded and the full cost recognized and paid for by the parties. If the full cost is so recognized, discussion between employers and employees will determine what benefits are needed and to what extent.

Conditions for Retirement

a) Earlier normal retirement

Several groups, notably the Ontario Provincial Police, seek special treatment in acquiring a fully accrued pension at retirement at age 55 with 30 years' service, or similar earlier retirement provisions. These provisions would create a desire among public employees in general for earlier retirement and would foster a demand for equal treatment on the ground of parity among public employees, unless special circumstances warrant different retirement provisions.

The OPP Association argues that such treatment should be afforded because of the stress accompanying the job and because its physical

requirements are such that working beyond age 60 may create a danger to the public. Similar arguments based on job stress were made by the TSF and the Ontario Nurses Association.

The Commission has pointed out the costs involved in earlier retirement. If such special treatment is granted, it should not be without recognition of the full cost and possibly increased contributions by the employees towards the costs, as is now done by some groups under OMERS. It is also necessary to consider the economic consequences of the loss of experienced personnel.

For these reasons the Commission does not favour any general reduction in the age at which unreduced pensions are available. It does acknowledge that there may be special circumstances for particular groups of employees which make unreduced pensions at lower retirement ages necessary.

In the Commission's opinion it has not been shown that job stress for certain groups in the public sector is any different from that in certain job situations in the private sector such as those of miners. Whether there are other special circumstances which warrant different treatment for any one group of government employees is a matter of informal bargaining between employer and employees.

The Commission therefore recommends that the Government of Ontario not take steps to lower the existing retirement ages at which unreduced pensions are available except where it can be demonstrated that unreduced pensions at earlier ages are a necessity for a special group. In those cases the additional cost of earlier unreduced retirement benefits should be fairly borne by employer and employees.

b) Calculation of actuarial reductions

The Ontario Teachers' Federation (Brief 192) raises a problem regarding actuarial reductions for early retirement which was not otherwise presented to the Commission. It proposed that pension reductions for early retirement never exceed actuarially determined reductions in benefits. There was no evidence offered that this in fact was happening, but the Commission would support the principle for all employment pension plans that the employee taking early retirement should not suffer a penalty greater than that required to protect the solvency of the pension plan. If this should become an issue it should be referred to the Pension Commission of Ontario for consideration and, if necessary, regulation.

c) Re-employment after retirement; the earnings test

The opportunity to retire on an actuarially unreduced pension prior to age 65 is more prevalent in public sector plans than in the private sector. Retirement conditions are described in Chapter 2. Whether or

not one should then be allowed to be re-employed either by the same employer or a new one without affecting the payment of the pension raises questions about the nature of a pension; whether a pension has been fully earned so that it is irrelevant whether or not one pursues other employment, or whether a pension is to provide income when one is no longer gainfully employed.

The latter view is reflected in the notion of an earnings test, under which the pension of a retired employee is suspended or reduced when earnings from employment exceeds a specified level. The notion of pensions as deferred wages, on the other hand, supports pensions as earned rights, with a pension to be received unconditionally once the conditions for earning it have been fulfilled.

An earnings test may be applied whether or not a retiree is 65. Although after age 65 there may be no dramatic decrease in employment earnings, there seems litle support for the imposition of an earnings test after age 65. Apparently there is a generally accepted shift to the view of a pension as an earned right once one has reached age 65.

Some public sector plans impose an earnings test. For example, if a pensioner receives more than the amount permitted under section 16 of the Public Service Superannuation Act (PSSA) from re-employment or engagement in the service of the Crown, the pension is reduced by the amount by which the pension payments plus the salary for the re-employment exceeds the salary at the time of retirement. However, there is an exemption where the person is re-employed in the expert category under the Public Service Act.

The Teachers' Superannuation Act generally prohibits re-employment while in receipt of a pension. In exceptional cases, the regulations provide a formula for reduction of pension income if a pensioner is re-employed. OMERS suspends the payment of pensions during re-employment unless the retiree has attained 71 years of age. Ontario Hydro permits certain re-employment of superannuates for a period of one year without suspension of pension.

The Commission received some criticisms of these earnings tests. Mr. Norman Adams (Brief 388) had worked for 27 years with the LCBO and retired in 1967. Since then, he had been employed on a casual basis as a court constable. He could earn $1,074.64 per quarter and then excess earnings were reduced dollar for dollar from his pension.

There are several inequities and issues related to the earnings test. The following should be noted:

1. Not all Ontario public sector plans have an earnings test.

2. The PSSA reduction formula is based on the latest pre-retirement earnings; these may be relatively low in nominal terms where the person has been retired for some years.

3. An earnings test previously provided in the federal public service plan was removed in 1975. Consequently, a retired federal civil servant, unlike his counterpart in Ontario, may have post-retirement earnings from any source without a reduction in pension - even if the new employment is with the federal or the Ontario government.

4. The PSSA provides for exemption from reduction or suspension if a person's expertise is desired by the Lieutenant-Governor in Council. Thus, low-level and unskilled workers are more likely to be subject to the earnings test. The sophisticated may also use corporate vehicles to avoid reduction.

5. Employment by employers other than the Crown does not affect pension entitlement. If the intent of the legislation is to prevent an employee from earning both pension and a salary simultaneously, the legislation does not go far enough - except perhaps for teachers. By the very nature of the training of a teacher and the employment opportunities, it is almost impossible for a retired teacher to obtain a teaching job in Ontario without offending the rule against continuing employment. The employer is to all intents the government, though a teacher may be hired by different boards of education. Thus the teacher is in the position where he or she cannot obtain other employment in his or her own field of expertise.

If the legislation is to control demand for re-employment after retirement it is questionable whether that control should be exercised in the guise of a limit on pension entitlement. If the Human Rights Code were amended to outlaw mandatory retirement provisions based on age, the use of an earnings test might become more widespread as a tool for controlling retirement age. The validity of an earnings test for this purpose could be questioned in both the private and the public sectors.

The use of earnings tests is not now widespread in the private sector. The auto industry has been unable to enforce these provisions (which extend to all employment and not just with the former employer) primarily because of unavailability of income tax information. In the Commission's opinion it is important for the government to monitor what is happening in the private sector to determine whether the earnings test should remain in those public sector plans which now use one. It should also be noted that retirees in the private sector who are subject to an earnings test with the same former employer have much more opportunity to find employment with a different employer. On this point alone, teachers can make a good case for the withdrawal of the earnings

test. However, teachers' pension levels and declining job opportunities may be such that an earnings test by itself will not result in hardship.

Revenue Canada has recently taken a position which concerns an earnings test for employment pensions. In response to a request from William M. Mercer Limited, Revenue Canada gave the following ruling:

> "There is no intention that the rules set out in Information Circular 72-13R5 prohibit an employee who has retired from employment and is in receipt of a pension from subsequently taking casual or part time employment with his former employer, whether over or under age 65 at the time of such re-employment, provided that such casual or temporary employment does not qualify as pensionable service under that employer's pension plan. In other words, such casual employees may receive both remuneration and pension at the same time, even though under age 65, provided they are not accruing further benefits under the plan.
>
> "Paragraph 10(a) of the Circular does not prevent an employee from retiring from one employer, taking employment with another and at the same time drawing a pension from the former and remuneration from the latter, regardless of the employee's age. The paragraph does, however, restrict an employee from retiring before age 65 for purposes of the plan only and continuing in employment with that employer - at least, it prevents payment of the pension prior to age 65 under such circumstances."(2)

Thus, Revenue Canada recognizes age 65 as a line of demarcation to be applied where a pension plan otherwise might pay benefits unconditionally to persons who qualify before that age, even if they continue in the same employment. To be acceptable for tax purposes, a plan therefore must impose some form of retirement test where a pension becomes payable before age 65. The test of retirement must relate at least to continuation with the same employer, but may allow for "casual or temporary employment" without affecting the person's pension. In no case - before or after age 65 - can further pension credits accrue to a retiree while a pension is being paid. There is no requirement, however, that the plan take notice of a pensioner's employment with another firm, or whether such other employment is pensionable under a different plan. (Certain exceptions to these rules are mentioned in the circular referred to above).

The OPP Association objected to the application of the PSSA earnings test to policemen, on the ground that re-employment in the private sector was unavailable. Whether certain groups within the PSSF such as police and teachers require special recognition of their inability to obtain re-employment other than in the Ontario public sector, should be a decision left to the particular employer and Management Board.

In the private sector the earnings or retirement test has developed in circumstances where those who were entitled to retire before normal retirement age were paid certain supplements to ensure they could live in retirement before payments from government programs (OAS and CPP) commenced. It was reasonable to preserve the intent of such supplements by requiring a complete or partial withdrawal from the work-force. Special provisions for unreduced pensions before age 65 in the public sector entail subsidies analogous to these supplements and therefore the Commission can endorse the use of an earnings test in the public sector plans before age 65. After that age however, taking into consideration the inequities mentioned above, the Commission sees no justification for the continuation of such tests.

The Commission therefore recommends that all earnings and retirement tests for public sector employees who have attained the age of 65 be abolished; and that other action be determined by the government after considering the Revenue Canada rules and examining its own re-employment policy, so that public sector policy for re-employment conditions will follow that in the private sector.

ADMINISTRATION OF PUBLIC SECTOR PENSIONS

Responsibility for the administration of several of the major public sector pension plans does not lie with the employer. OMERS is administered by an 11-member board consisting of 7 employees, 2 elected representatives, and 2 civil servants, all appointed by the Lieutenant-Governor in Council; the TSF is administered by the Teachers' Superannuation Commission, consisting of 6 members appointed by the Minister of Education and 5 appointed by teachers; the Queen's University plan is administered jointly by employer and employees; HOOPP is operated by an employer association, the Ontario Hospitals Association.

This separation of responsibility from the employer creates special problems for the control of pension costs. We have already noted the effect on pension costs of the fact that teachers' salaries are bargained between teachers and individual school boards (the employer) while the pension benefits are settled through the Ministry of Education. The government should pay particular attention to costs where the employer is not in control of the pension administration.

Either the employer pays all costs of administration or costs are paid out of plan funds. With one exception, the employer's contributions are charged to the employing institution, even in multi-employer plans. This is also true for the PSSF which charges back to employing ministries and agencies all payments made on behalf of members, including deficiencies. The exception is the TSF, to which the Ministry of Education pays all employer payments including deficiencies, with no charge-back to the employing school boards. Administrative costs for OMERS were 6 per cent of expenditures ($23.4 million) in 1976. PSSF

administrative costs in 1978 were $1.6 million, or 2.8 per cent of expenditures.

There is clearly no overall control by any one person, ministry, commission or board, of the cost or co-ordination of pension benefits. The area of cost and its allocation which is of prime concern to the Commission, has been dealt with extensively and recommendations made for the establishing of cost control. The question of co-ordinating pension benefits remains.

Most provinces in Canada have established central co-ordinating and control mechanisms for public employee pension funds. The same is true of many jurisdictions in the United States. In the last two or three years, steps have been taken to strengthen existing mechanisms as a result of a better understanding of pensions generally and a greater awareness of their financial impact. Control is exercised either through the consolidation of public sector pension plans, as in Quebec and some U.S. jurisdictions, or the establishment of a central board or commission with responsibility for recommending legislative changes and controlling costs. The latter method is used in British Columbia.

In Ontario, limited control has been instituted through a review by Management Board of proposals for changes in public sector pension provisions where the plan is established under acts or regulations. Guidelines for pension valuation have also been issued to the five major plans. A number of pension plans in the public sector, however, are not subject to specific legislation. No legislation other than the Pension Benefits Act exists to establish standards or control for all pension plans applicable to public employees in Ontario.

The Commission considered alternatives to solve the co-ordination and control problem in addition to its recommendations for cost control. One alternative was a consolidated public sector pension plan to cover all public sector employees. While it would not be difficult to legislate a basic plan, it would probably be necessary, for the accommodation of the needs of different groups (such as teachers and police), to adopt supplementary plan features as has been done under the OMERS plan. In that event, the real difficulties of funding, cost control and varying employer-employee relationships would remain. Indeed these problems could be magnified by combining groups with different experience, such as HOOPP with its mobile work-force and the TSF with its long-service employees. The same benefits will have different costs depending on the make-up of the group. These costs in return could affect the contributions required from the employees.

One large plan would also present administrative difficulties in representation from the various sub-sectors and unions. A body made up of many representatives, each with a special interest to advance, is unlikely to achieve an overall view of the needs of the whole group.

On the other hand, if all groups were not represented in some way the scheme would lose credibility and there would inevitably be employee dissatisfaction.

While such an overall plan might have positive effects for administrative control, the Commission sees it as disruptive in the extreme for the employees, who are familiar with their existing plans and for whom the individual plan design is probably most appropriate. As long as the defined benefit plan continues to be the normal vehicle for public sector plans the Commission would not recommend a consolidated pension plan. However, if, as suggested in the discussion of cost control, such control cannot be effected and there is a move to the defined contribution plan type, then one consolidated plan could be seriously considered.

Another alternative the Commission considered was the creation of a central board or commission with legislated authority to assume the tasks of providing cost control and co-ordination for all plans in the public sector. The purpose of such a body would be to:

- make such recommendations to the government as will result in consistent and cost-efficient pension benefits for public employees, bearing in mind the impact of any changes on the private sector;

- ensure that costs of existing or projected pension benefits in the public sector are reported on a consistent and generally accepted basis;

- receive submissions from public employers, employees, unions, pensioners, plan administrators, and other interested parties, on pension benefits matters;

- recommend to the government the organization and responsibilities of pension plan administrative boards and investment committees in the public sector, including provisions for appropriate employee representation;

- maintain such records as are necessary for the performance of its duties and require appropriate regular reporting from public sector pension plans.

The Commission does not favour the creation of such a body at this time but prefers instead that cost control be effected through Management Board and the Treasury as recommended earlier. With the overall cost control function might be linked the power to organize administrative and investment committees to advise the plan sponsors. Cost control through Management Board and Treasury goes to the very heart of the cost problem. Creating another board to stand between the plan sponsors and Management Board and the Treasury might produce only

additional complexity, with the final decision still to be made at Management Board and Treasury level.

In the Commission's opinion, it is important that a viable cost control and co-ordinating mechanism be put in place before the government proceeds with changes in the existing pension benefits structure in the public sector.

There may be need for some body to deal specifically with individual employee matters such as adjudication of any pension entitlement disputes. At the present time there is no appropriate appeal procedure established. Since pensions are not generally negotiable in the public sector, differences cannot be resolved by a grievance board, and some appeal procedure is necessary. This should be made available through the Pension Commission of Ontario, as recommended in Volume III, Chapter 13. It is important that the same body adjudicate pension entitlement disputes for both the public and the private sectors. This is in keeping with the principle of employing a common approach for both sectors. It is also important for government employees to have access to a body which is independent from the government as pension plan sponsor.

EFFECT ON THE PUBLIC SECTOR OF THE COMMISSION'S RECOMMENDATIONS FOR EMPLOYMENT PENSION PLANS

The Commission affirms the principle that government employer pension plans should be administered on the same basis as those of employers in the private sector. Accordingly, the recommendations contained in the first part of the report, "Design for Retirement," are equally applicable to all employment pension plans in Ontario. The only recommendation which is different for public sector plans is that which requires public sector plans having assets of more than $150 million to file an actuarial valuation annually with the Pension Commission of Ontario, while all other plans (in the private or public sector) need file only triennially. Where Volume VI is silent on important matters such as eligibility, transfer rights, vesting, portability, etc., reference should be had to Volumes II and III.

The recommendations for the establishment of a mandatory retirement savings plan (PURS) will have the same implications for public sector plans as it has for those in the private sector. If PURS is adopted, the public sector plans will become more supplementary and may be altered to meet the needs of the work-force covered by a particular plan. The PURS plan may be in addition to the employment pension or it may be integrated with it. We have set out in Volume II the requirements for integration.

For the public sector the Commission sees a special need to assess existing plans both with and without PURS integration, on a net re-

placement ratio basis. Since the major public sector plans are using final or best average formulas they may already be providing adequate retirement income when the pension payment is added to income from government programs, in terms of "available income" as defined by the Commission in assessing adequacy of government programs. Accordingly, instead of increasing the total benefit, it may be better to allocate any funds released by integration with PURS to the provision of inflation protection.

PURS should not be a signal simply to increase existing pension benefits for government employees by ignoring integration. This would have serious implications for government costs and would also require an additional contribution from government employees who are already contributing higher percentages than those in most private sector plans. Clearly, there is a need to observe a reasonable balance between people's provision for retirement income and their present-day consumption requirements.

If employment plans are integrated with PURS it will be incumbent on the Pension Commission of Ontario to see that the rights on transfer are protected for the PURS minimum on a fully funded basis as in any defined contribution plan. The Commission's recommendations for the funding of public sector plans should therefore be implemented as soon as possible if integration with PURS is to be undertaken.

NOTES

(1) Landreville v. The Queen, unreported, Federal Court of Canada, April 29, 1980. Judge McEwan argues in a letter to the Commission dated September 9, 1980:

"In my submission, that decision fortifies the contention contained in my brief, filed on January 24th, 1980, that the word 'may' where it appears in the first line of section 28(1) of The Provincial Courts Act is mandatory and must be read as 'shall.'

"I have also drawn the attention of your Counsel to the provisions of section 99c(1) of The Judicature Act R.S.O. 1970 as amended. This section was enacted by Section 4 of The Judicature Amendment Act S.O. 1975 Chap. 30. Prior to this enactment, the Masters of the Supreme Court derived their pensions from the Public Service Superannuation Fund. Section 99c(1) obviously envisaged and intended inter alia the creation of a new scheme of pensions for the Masters which would be separate from the Public Service Superannuation Fund; and for the transfer to that scheme of the existing entitlement to benefits which the Masters were considered to have from the Public Service Superannuation Fund. In my submission, any construction of section 99c(1), other than the foregoing, would render the section meaningless and superfluous.

"Much of the wording of section 99c(1) is almost identical to that of section 28(1) of The Provincial Courts Act. If the foregoing submission as to the intention of the Legislative Assembly in enacting section 99c(1) of The Judicature Act is correct, it was likewise the intention of the Legislative Assembly that Provincial Judges, their widows and surviving children be provided inter alia with a scheme of pension benefits separate from the Public Service Superannuation Fund."

(2) Quoted from Mercer Actuarial Bulletin, August, 1979, Volume 29, Number 8.

LIST OF TABLES

Table 1 - Ontario Public Sector, Transfers Into and Out of Plans with Reciprocal Agreements, 1977 202

Chapter 7

Conclusions

The Commission sees pensions for public sector employees as no different from those for private sector employees. They are provided voluntarily, may be wound up voluntarily, and reflect the needs and desires of the particular employee group and its employer. It follows that the regulation and operation of these plans should parallel the private sector, except in the very few instances where closer regulation is required in the public sector for cost control purposes. Therefore the discussion and recommendations for employment pensions set out in Volumes II and III apply equally to pension plans in both sectors.

Recommendations in this volume are primarily directed to having public sector pensions move to parallel operation with private sector plans; for example, in funding under the Pension Benefits Act, investment in the private sector markets, and in bringing indexing within the plan provisions.

The Commission sees pension benefits themselves within the scope of total compensation. The Commission endorses the principle that the public sector should not lead the private sector in total compensation, however difficult the establishment of criteria for measuring compensation. There should therefore be some concern on the part of the government to achieve overall parity between the private and the public pension sectors. We say "overall" because we recognize that the same benefits for different groups of people will vary in cost, and we regard cost as the most important criterion for comparing total compensation. Within overall parity there should also be room to accommodate the special needs of a particular group of employees. As in the private sector, preferences of a group of employees should be determined by negotiation, formal or informal, between those employees and their employer.

Having said that public sector and private sector pensions should be treated in the same way, we also have to recognize that public sector pension plans differ markedly in size, and in degree of cost control. As a result, there are special problems of administration. At the present time these problems are aggravated by data prepared on differing bases and for differing time periods, and by a lack of control over all public sector pensions by one agency of government. Our recommendations are directed to solving these problems with a view to putting the government in a sound position to recognize and control pension costs in the future. If this is not done now the overall costs will very soon be out of control to the detriment of the taxpayers of Ontario and ultimately the plan members. The alternative to the kind of cost control recommended is to discontinue the present plans and switch to a money-purchase design. If it is impossible for government to identify and control the costs of its pension plans, then perhaps the only answer is a new design. Cost control is, without doubt, the most important area in which the government must take action now for public sector pension plans.

The recommendations applying specifically to public sector plans are set out in full in the Summary Report.

Index

Caisse de dépôt, 116
Canada Pension Plan (CPP), iv, 23, 33, 41, 42, 43, 44, 45, 59, 71, 73, 81, 93, 95, 116, 117, 118, 126, 132, 144, 155, 156, 157, 175, 177, 179, 184, 185, 188, 204, 206
Canadian Union of Public Employees (CUPE), 31, 43, 56, 57, 91, 111, 193, 209
Caucus Employees Retirement Plan, 33, 78
Cofirentes Report, 36
Colleges of Applied Arts and Technology (CAAT), 30, 33, 43, 194, 198, 202, 209
Consolidated Revenue Fund, 36, 77, 79, 80, 99, 108, 177
Consumer Price Index (CPI), 34, 60, 75, 79, 177, 181, 204

Employment pension plans, iv, v, 214
ERISA, 31

Financial Executive Institute, 144, 145, 146

Government programs. See individual programs, e.g., CPP, GIS
Guaranteed Annual Income System (GAINS), iv, 45
Guaranteed Income Supplement (GIS), iv, 45

Hospitals of Ontario Pension Plan (HOOPP), iv, 2, 3, 11, 14, 16, 20, 25, 28, 29, 31, 32, 33, 34, 36, 39, 41, 43, 50, 53, 54, 56, 57, 66, 70, 78, 86, 95, 102, 105, 133, 144, 149, 156, 157, 167, 175, 178, 181, 188, 194, 196, 201, 202, 203, 210, 215, 216

Judges' pensions, 204-208

Legislative Assembly Retirement Allowances Account (LARA), 58, 65, 77, 100, 102, 116, 118, 151, 206, 208

Management Board guidelines, 93-96, 150
Management Board of Cabinet, 93, 148, 149, 150, 151, 152, 154, 214, 216, 217
Ministry of Treasury, Economics and Intergovernmental Affairs (Ontario) (TEIGA), 115, 116, 177, 179, 180

Money-purchase plans, 29, 59, 60, 90, 92, 223
Multi-employer plans, iv, 1, 2

Old Age Security (OAS), 42
Ontario Hydro Employees' Pension Plan, iv, 2, 3, 11, 12, 16, 23, 29, 30, 32, 33, 34, 36, 43, 46, 53, 54, 55, 66, 70, 78, 84, 86, 87, 95, 102, 112, 127, 133, 139, 144, 146, 149, 152, 156, 157, 164, 167, 169, 172, 180, 181, 188, 192, 195, 201, 202
Ontario Labour Relations Act, 193
Ontario Labour Relations Board, 29
Ontario Municipal Employees Retirement Systen (OMERS), iv, 2, 3, 12, 14, 16, 20, 28, 30, 31, 32, 33, 37, 39, 40, 43, 46, 52, 53, 54, 56, 58, 66, 69, 70, 71, 74, 91, 99, 102, 109-110, 111, 114, 115, 116, 118, 128, 133, 144, 148, 149, 156, 157, 163, 164, 167, 177, 178, 181, 188, 193, 197, 199, 200, 201, 202, 203, 210, 212, 215
Ontario Northland Transportation Commission (ONTC), 2, 12, 29, 33, 38, 85, 180, 192
Ontario Nurses Association (ONA), 31, 50, 56, 57, 194, 203, 211
Ontario Provincial Police Association (OPPA), 44, 50, 57, 194, 208, 210, 214
Ontario Public Service Employees Union (OPSEU), 36, 40, 41, 43, 56, 57, 110, 194, 196, 209
Ontario Public Service Superannuation Fund (PSSF) iv, 11, 13, 16, 20, 22, 25, 28, 30, 32, 33, 34, 37, 38, 41, 43, 46, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 65, 66, 69, 74, 77, 78, 79, 84, 86, 93, 95, 100, 105, 108, 109, 110, 113, 114, 116, 118, 131, 133, 134, 139, 142, 143, 147, 149, 151, 156, 157, 167, 175, 177, 178, 183, 187, 188, 193, 197, 201, 202, 204, 207, 208, 209, 214
Ontario Teachers' Federation (OTF), 32, 36, 40, 43, 50, 51, 57, 90, 91, 111, 192, 195, 211

Pension Benefits Act (Ontario), iv, v, 65, 67, 69, 70, 73, 75, 76, 78, 94, 95, 118, 127, 128, 180, 193, 201, 207, 208, 216, 222
Pension Benefits Standards Act (federal), v
Pension Commission of Ontario, 40, 71, 95, 96, 124, 133, 150, 211, 218, 219
Private pension plans. See Employment pension plans
Provincial Universal Retirement System (PURS), 218, 219
Public sector
  data, v-vi, 83, 145
  other jurisdictions, 40, 58-61, 124, 216
  study, vi, 30-32, 36, 83-84, 85, 87, 145
Public sector pension plans, iv, v, 1-3, 28-29, 54, 65-67. See also individual plans, e.g., Teachers' Superannuation
  administration, 215-218
  benefits, 13, 16, 22, 36-45, 210
  collective bargaining, 192-199
  comparison with private sector, 139-146
  contributions, 52-53
  costs, 121-134, 139-158, 162-164, 166-167, 169, 175, 177-181, 183-185, 187-188
    control, 146-154
    future, 154-158, 162-164, 166-167, 169, 172, 175, 177-181, 183-185, 187-188

funding, 20, 22-23, 25, 36, 65-67, 69-87, 90-96
growth rates, 17-18, 20-23, 157-158, 162-164, 187
indexing, 36, 155, 185, 187, 210
investment, 99-103, 105, 107-118
non-marketable debentures, 103, 105
locking-in, 54, 55
matching contributions, 29, 53, 71-76
membership, 3, 8-9, 11-14, 16, 17, 18, 20, 29-32
parity, 142, 208-214
portability, 54-57
reciprocal transfer agreements, 56, 200-204
retirement age, 46-47, 50-52, 210-211
termination rates, 9, 166-167, 172, 187
vesting, 11-13, 46, 54, 55
Public Service Superannuation Act of Canada (PSSA), v, 1, 51, 76

Quebec Pension Plan (QPP), 116

Registered Retirement Savings Plan (RRSP), 29, 43, 55, 201, 203, 204
Revenue Canada, 214, 215

Superannuation Adjustment Benefits Act (SABA), 33, 36, 75, 78-80, 82, 83, 100, 116, 126, 127, 144, 151, 204
Superannuation Adjustment Fund (SAF), 177, 179, 181, 183

Teachers' Superannuation Fund (TSF), iv, 1-2, 13, 16, 20, 22, 23, 25, 28, 30, 31, 32, 33, 36, 39, 41, 43, 46, 52, 54, 56, 65, 66, 69, 71, 72, 73, 74, 77, 78, 79, 80, 84, 86, 93, 95, 100, 102, 105, 108, 109, 111, 116, 118, 125-127, 129, 130, 133, 134, 139, 144, 147, 148, 149, 151, 156, 157, 183, 87, 188, 193, 197, 201, 211, 215, 216
Toronto Transit Commission (TTC), 2, 29, 30, 32, 38, 152, 197
Treasurer of Ontario, 77, 79, 96, 149, 150, 151, 152, 217

Workmen's Compensation Board (WCB), 1, 23, 28, 38, 39, 46, 53, 66, 71, 84, 87, 103, 128, 133, 141, 142, 143, 149, 150, 198

Year's Maximum Pensionable Earnings (YMPE), 33, 41, 43, 44, 45, 53, 59, 93, 95, 126, 178, 180, 185

Report of the Royal Commission on the Status of Pensions in Ontario

VOLUME VII

Pensions for Ontario Public Sector Employees

Background Studies

1980

Report of the Royal Commission on the Status of Pensions in Ontario

Design for Retirement

Volume I
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VOLUME VII

Pensions for Ontario Public Sector Employees

Background Studies

1980

Pensions for Ontario
Public Sector Employees

Contents

VOLUME VI

Introduction

1. Membership

2. Plan Features

3. Funding of Public Sector Plans

4. Investment

5. Present and Future Costs

6. Other Public Sector Pension Issues

7. Conclusions

Index

VOLUME VII

Background Studies

Pensions for Ontario
Public Sector Employees

Volume VII
Background Studies

Contents

Ontario Public Sector Employee Pension Plan Data
Laurence Kelly 1

Study of Public Sector Pension Plans
Keith H. Cooper 113

Legislative History of Public Sector Pension Plans
Ann Jamieson 176

Ontario Public Sector Pension Plan Data

Laurence Kelly

December 4, 1978

CONTENTS

List of Tables 2

Number and Membership of Pension Plans 8

Summary of Major Plan Provisions 10

Age, Sex, and Service Profile of Ontario Public Sector Pension Plan Membership 32

Growth of Pension Plan Membership in the Ontario Public Sector 50

Vesting 56

Pension Recipients 59

Growth of Pensioners 69

Employers' Pension Costs 79

Pension Plan Fund Assets and Liabilities 91

Pension Fund Investments 104

Annualized Yields of Pension Funds 107

LIST OF TABLES

Table 1 - Pension Plans and Membership in the Ontario Public Sector 9

Table 2.1 - Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Government 11

Table 2.2 - Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Municipal 14

Table 2.3 - Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Health 19

Table 2.4 - Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education 22

Table 2.5 - Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Utilities 29

Table 3 - Ontario Public Sector Pension Plan Active Members, All Sub-sectors, by Age and Sex, December 1977 33

Table 3.1 - Ontario Public Sector Pension Plan Members, Provincial Government and Agencies, by Age and Sex, December 1977 34

Table 3.2a - Ontario Public Sector Pension Plan Members, Municipal Open Plans, by Age and Sex, December 1977 35

Table 3.2b - Ontario Public Sector Pension Plan Members, Municipal Closed Plans, by Age and Sex, December 1977 36

Table 3.3 - Ontario Public Sector Pension Plan Members, Health Sub-sector, by Age and Sex, December 1977 37

Table 3.4 - Ontario Public Sector Pension Plan Members, Education Sub-sector, by Age and Sex, December 1977 38

Table 3.4a - Ontario Public Sector Pension Plan Members, Education Sub-sector, Teachers' Superannuation Fund, by Age and Sex, December 1977 39

Table 3.4b - Ontario Public Sector Pension Plan Members, Education Sub-sector, Universities, by Age and Sex, December 1977 40

Table 3.5 - Ontario Public Sector Pension Plan Members, Provincial Utilities, by Age and Sex, December 1977 41

Table 3.6a - Ontario Public Sector Pension Plan Members, Provincial Legislature Sub-sector, Legislative Assembly Members, by Age and Sex, December 1977 42
Table 3.6b - Ontario Public Sector Pension Plan Members, Provincial Legislature Sub-sector, Caucus Employees, by Age and Sex, March 31, 1978 43
Table 3A - Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Provincial Government Sub-sector, by Age and Length of Service, December 1977 44
Table 3B - Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, by Age and Length of Service, Open Municipal Plans, December 1977 45
Table 3C - Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Closed Municipal Plans, by Age and Length of Service, December 1977 46
Table 3D - Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Health Sub-sector, by Age and Length of Service, December 1977 47
Table 3E - Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Education Sub-sector, by Age and Length of Service, December 1977 48
Table 3F - Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Provincial Utilities Sub-sector, by Age and Length of Service, December 1977 49
Table 4.1 - Ontario Public Sector Pension Plans, Active Membership Growth, Provincial Government Sub-sector, 1960-1977 51
Table 4.2 - Ontario Public Sector Pension Plans, Active Membership Growth, Municipal Sub-sector, 1960-1977 52
Table 4.3 - Ontario Public Sector Pension Plans, Active Membership Growth, Health Sub-sector, 1960-1977 53
Table 4.4 - Ontario Public Sector Pension Plans, Active Membership Growth, Education Sub-sector, 1960-1977 54

Table 4.5 - Ontario Public Sector Pension Plans, Active Membership Growth, Provincial Utilities Sub-sector, 1960-1977 55
Table 5 - Ontario Public Sector Pension Plan Coverage, by Vesting Provisions 57
Table 6 - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), all Sub-sectors, by Age, Sex, and Year of Retirement, December 1977 60
Table 6.1 - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Provincial Government Sub-sector, by Age, Sex, and Year of Retirement, December 1977 61
Table 6.2a - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Closed Municipal Plans, by Age, Sex, and Year of Retirement, December 1977 62
Table 6.2b - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Open Municipal Plans, by Age, Sex, and Year of Retirement, December 1977 63
Table 6.3 - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Health Sub-sector, by Age, Sex, and Year of Retirement, December 1977 64
Table 6.4 - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Total Education Sub-sector, by Age, Sex, and Year of Retirement, December 1977 65
Table 6.4a - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, Teachers and Colleges, by Age, Sex, and Year of Retirement, December 1977 66
Table 6.4b - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, Universities, by Age, Sex, and Year of Retirement, December 1977 67
Table 6.5 - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Provincial Utilities Sub-sector, by Year of Retirement, December 1977 68
Table 6.6 - Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Provincial Legislature Sub-sector, Legislative Assembly Members, by Age, Sex, and Year of Retirement, December 1977 68

Table 7.1 - Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Provincial Government Sub-sector, 1960-1977 70
Table 7.2a - Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Open Municipal Plans, 1960-1977 71
Table 7.2b - Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Closed Muncipal Plans, 1960-1977 72
Table 7.3 - Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Health Sub-sector, 1960-1977 74
Table 7.4 - Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, 1960-1977 75
Table 7.5 - Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Provincial Utilities Sub-sector, 1960-1977 78
Table 7.6 - Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Provincial Legislature Sub-sector, 1960-1977 78
Table 8.1 - Ontario Public Sector, Employer's Payments into Pension Plans, as a Percentage of Pensionable Payroll, Provincial Government and Agencies, 1971-1977 80
Table 8.2 - Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Municipal Sub-sector, 1971-1977 81
Table 8.3 - Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Health Sub-sector, 1971-1977 83
Table 8.4 - Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Education Sub-sector, 1971-1977 84
Table 8.5 - Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Provincial Utilities Sub-sector, 1971-1977 86

Table 8.6 - Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Provincial Government Sub-sector, 1971-1977 86
Table 8.7 - Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Municipal Sub-sector, 1971-1977 87
Table 8.8 - Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Health Sub-sector, 1971-1977 88
Table 8.9 - Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Education Sub-sector, 1971-1977 89
Table 8.10 - Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Provincial Utilities Sub-sector, 1971-1977 90
Table 9.1 - Ontario Public Sector, Assets and Liabilities of Pension Plans, Provincial Government Sub-sector, as of December 31, 1977 92
Table 9.2 - Ontario Public Sector, Assets and Liabilities of Pension Plans, Municipal Sub-sector, as of December 31, 1977 93
Table 9.3 - Ontario Public Sector, Assets and Liabilities of Pension Plans, Health Sub-sector, as of December 31, 1977 94
Table 9.4 - Ontario Public Sector, Assets and Liabilities of Pension Plans, Education Sub-sector 95
Table 9.5 - Ontario Public Sector, Assets and Liabilities of Pension Plans, Provincial Utilities Sub-sector, as of December 31, 1977 98
Table 9.6 - Ontario Public Sector, Liability Data for Current Pensioners, Provincial Government Sub-sector 99
Table 9.7 - Ontario Public Sector, Liability Data for Current Pensioners, Municipal Sub-sector 100
Table 9.8 - Ontario Public Sector, Liability Data for Current Pensioners, Health Sub-sector 101

Table 9.9 - Ontario Public Sector, Liability Data for Current Pensioners, Education Sub-sector 102
Table 9.10 - Ontario Public Sector, Liability Data for Current Pensioners, Provincial Utilities Sub-sector 103
Table 10 - Ontario Public Sector, Pension Fund Investment Portfolio, by Sub-sector, December 1977 or Latest Available Date 106
Table 11.1 - Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Provincial Government Sub-sector 108
Table 11.2 - Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Municipal Sub-sector 109
Table 11.3 - Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Health Sub-sector 110
Table 11.4 - Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Education Sub-sector 111
Table 11.5 - Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Provincial Utilities Sub-sector 112

NUMBER AND MEMBERSHIP OF PENSION PLANS

Table 1 provides the number and membership of plans by size within each sub-sector. These data are as of January 1, 1978 or the latest date as provided by the plan sponsor or Statistics Canada.

Table 1 shows that:

1. Six plans out of 127 with more than 10,000 members each account for 86.5 per cent of the total membership. These are:

	Members
Teachers' Superannuation Fund (TSF)	114,563
Ontario Municipal Employees Retirement System (OMERS)	106,731
Public Service Superannuation Fund (PSSF)	76,712
Hospitals of Ontario Pension Plan (HOOPP)	63,645
Ontario Hydro Pension Plan (Hydro)	20,478
Colleges of Applied Arts and Technology (CAAT)	11,720

2. Twenty-two other plans with between 1,000 and 10,000 members each account for another 10.7 per cent of all members.

3. The remaining 99 plans account for no more than 2.7 per cent of the members.

Out of 127 plans, 46 plans with 14,000 members are closed to new members. Most of these closed plans are in the municipal sector where the new employees are required to join OMERS.

Table 1
Pension Plans and Membership in the Ontario Public Sector

Sub-sector	Active member population: Less than 10	10 to 25	26 to 100	101 to 1,000	1,001 to 10,000	More than 10,000	Total	Per Cent
Provincial government:								
Plans	3	-	7	2	1	1	14	
Members	6	-	363	542	2,264	76,712	79,887	17.6
Municipal government:								
Plans	21	12	4	3	8	1	49	
Members	58	207	137	802	21,080	106,731	129,015	28.3
Health:								
Plans	1	1	-	3	3	1	9	
Members	9	15	-	729	4,712	63,645	69,110	15.2
Education:								
Plans	11	1	10	18	9	2	51	
Members	53	24	562	8,544	19,238	126,283	154,704	34.0
Provincial utilities:								
Plans	-	-	-	-	1	1	2	
Members	-	-	-	-	1,622	20,478	22,100	4.8
Legislative assembly:								
Plans	-	-	-	2	-	-	2	
Members	-	-	-	280	-	-	280	.1
All sectors:								
Plans	36	14	21	28	22	6	127	
Members	126	246	1,062	10,897	48,916	393,849	455,096	
Per cent of members	.0	.1	.2	2.5	10.7	86.5		100.0

SUMMARY OF MAJOR PLAN PROVISIONS

The following pages provide summary descriptions of the major plans in each sub-sector. A brief description of other plans in each sub-sector is also included.

As can be seen in this section, major plans in the Ontario public sector have pension benefits based on average of highest earnings years. Except for the McMaster University Non-contributory Plan (hourly staff) all plans require the employees to contribute.

Table 2.1
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Government

	Public Service Superannuation Fund	Workmen's Compensation Board
Enabling legislation	Public Service Superannuation Act - Detailed Plan Provisions - Superannuation Adjustment Benefits Act	Regulations under the Workmen's Compensation Act - Detailed plan provisions
Date established	1920	1940
Type of plan	Average best earnings	Average best earnings
Eligibility conditions:		
- included	Civil servants and full time employees in agencies	Same as PSSF
- excluded	Part-time employees - seasonal and casual	
Employee contributions	7% including CPP and Adjustment Fund	6% including CPP if hired in 1971 or later. Prior to 1971 see Special Conditions
Employer contributions	Matching employees. Amortization of deficiencies is made under OPB Act.	Balance required to fund which amounted to 235% of employee contributions in 1976-77
Vesting conditions	10 years pension credit	Same as PSSF
Unit of pension benefit	2% less CPP offset	Same as PSSF
Earnings base for pension	Best 5-year average - see Special Conditions	Best 5-year average if hired in 1971 or later, see Special Conditions for employees hired earlier
Integration with CPP	.7% offset up to average of final 3-year YMPE for service from January 1966	Same as PSSF
Maximum pension as % of earnings base	70% less CPP offset	Same as PSSF
Retirement conditions and benefit:		
- normal retirement	Age 65 with 10 years' service	Same as PSSF
- early retirement unreduced	Age 60 with 20 years, or age + service = 90	Same as PSSF
- early retirement reduced	Pension reduced by 5% for each year earlier than 65 to age 55	Same as PSSF
Post-retirement indexation provisions:		
- benefit	Ad hoc 1971-75. Regular annual from 1976 based on CPI with ceiling of 8%	Regular ad hoc
- funding	For employees who retired prior to 1976 indexing funded by employer. For employees	Paid from the Fund, see employer contribution

Table 2.1 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Government

	Public Service Superannuation Fund	Workmen's Compensation Board
Post-retirement indexation provisions:		
- funding (continued)	who retired in 1976 and later, funding shared equally by employer and employees	
Options	Purchase of military service and eligible past service	Same as PSSF
Survivor benefits:		
- before retirement		
pension	10 or more years' service - 50% of accrued pension	Same as PSSF
	Less than 10 years' service - return of contributions with interest double if married, single if not	Refund of single contributions with interest
insurance	75% of 1 year's salary, employer paid	1 or 3 times salary. Substantial subsidy by employer
- after retirement		
pension	50% of pension	Same as PSSF
insurance	$2,000 first year of retirement) $1,750 second year of retirement) $1,500 for life)	If hired prior to 1974 - 50% of insurance while active. If hired after 1974 - $2,000
Disability benefit:		
- pension benefits	Accrued vested pension payable after 10 years' service if not receiving insured income	Same as PSSF
- income insurance	66.6% of salary with continued pension accruals	Same as PSSF except for maximum payment of $24,000 per year
Portability	Reciprocal agreements with other Ontario public sector plans and other public jurisdictions in Canada	Agreement with Public Service Superannuation Fund only
Fund investments	Separate account maintained by the government to which interest is credited at the average provincial bond rate	Market diversified
Plan administration:		
- responsibility	Employer	Employer
- financing	Employer	Employer

Table 2.1 (concluded)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Government

	Public Service Superannuation Fund	Workmen's Compensation Board
Collective bargaining:		
- formal	No	No
- other bargaining unit input	1 union representative on 4-member board. Joint consultation committee to discuss all pension issues	Informal consultation
Auditing practice	Audited by the Provincial Auditor each fiscal year	Same as PSSF
Special conditions	Contributors to the PSSF on and before December 31, 1965 are guaranteed they will receive no less from the PSSF plus the CPP under the terms of the Public Service Superannuation Act as at January 1, 1966 than they would have under the old plan as it existed prior to January 1, 1966. (i) For persons retiring at age 65 in 1978 this guarantee affects only employees at very high salary levels. It does, however, substantially increase the entitlement of employees retiring early for all years prior to reaching age 65. (ii) Early retirement with a reduction can occur between the ages of 50 and 60. Maximum reduction of 50% at age 50.	1. Salary includes overtime 2. Employee contribution rate. Employees hired in 1971 or earlier contribute on the basis of a scale related to age from 4.4% to 5.75%, so that most of the senior employees are now paying at a much lower rate than junior employees. This is not done in any other public sector plan. 3. Retirement benefits for those eligible provides pensions for service prior to January 1, 1966 at 2% of average earnings during the 3 highest paid years of the last 10.

Summary of Smaller Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Government

Ontario Educational Communications Authority: Benefits are generally the same as the PSSF except for post retirement adjustments. Employees contribute 6% including CPP contribution and the employer provides the balance required to fund the plan.

Urban Transportation Development Corporation Ltd: Benefits are generally the same as the PSSF except for post-retirement adjustments and the employee contributions of 5% including CPP.

Art Gallery of Ontario: Benefits and employee contributions are generally the same as the PSSF except that post-retirement adjustments are made on an ad hoc basis.

Other Plans:

All other plans in this sub-sector are on a money purchase basis and generally have a very limited membership.

Table 2.2
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Municipal

	Ontario Municipal Employees Retirement System	Toronto Transit Commission
Enabling legislation	The Ontario Municipal Employees Retirement System. Detailed plan provisions	No specific pension legislation
Date established	1963	1940
Type of plan	Average best earnings	Career average updated to 1974 salary
Eligibility conditions:		
- included	Where muncipal employers elect to participate in OMERS, all employees with full-time continuous service must participate. Some part-time workers who are "deemed" to be full-time by employing municipality	Full-time employees with 6 months' service or more
- excluded	Casual workers	
Employee contributions	5.5% up to YMPE, 7% above YMPE	6.79% less CPP contributions
Employer contributions	5.5% up to YMPE, 7% above YMPE. Balance required to fund	Matching plus costs for certain supplemental benefits
Vesting conditions	Immediate	In accordance with Ontario Pension Benefits Act
Unit of pension benefit	2% less CPP offset	(1.5% of 3 year YMPE average to 1974 up (to $6,533 - plus 2% of average 3-year (earnings above $6,533 to December 31, (1974 x years of service to 1974, plus (1.5% of earnings up to YMPE plus 2% of (earnings over YMPE for each year from (1975
Earnings base for pension	Best 5-year average	
Integration with CPP	.7% offset up to average of final 3-year YMPE for service from January 1966	
Maximum pension as % of earnings base	70% less CPP offset	70% less CPP offset
Retirement conditions and benefit:		
- normal retirement	Age 65	Age 60 - basic pension is for life guaranteed 5 years
- early retirement unreduced	None - except under supplementary plans, see special conditions	30 years' service
- early retirement reduced	From age 55 with pension actuarially reduced	Age 55 - reduction in accordance with table
Post-retirement indexation provisions		
- benefit	Ad hoc increases 1970-75 totalling approximately 40% paid at the same time as the up-	Ad hoc increases totalling 15% since 1975

Table 2.2 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Municipal

	Ontario Municipal Employees Retirement System	Toronto Transit Commission
Post-retirement indexation provisions (continued)	grading of the career average formula for active employees	
- funding	Fund income	Fund income
Additional voluntary contributions	None - except to supplementary plans which are negotiated	To purchase additional pensions
Options	Three types of satellite plans provide for retirement on unreduced pension at 60 or age 55 with 30 years' service or age 50 with 30 years' service. See supplementary plans under Special Conditions (1)	Joint and last survivor. Life and 10 or 15 years guarantee and level income
Survivor benefits:		
- before retirement		
pension	50% of accrued pension to spouse and 10% for each child to a maximum of 75%. Spouse can take refund of contributions instead of pension.	Return of contributions with interest if no option is selected
insurance	Varies, but average is generally 2 times annual salary paid by the employer	$5,000-$15,000 depending on service (1-6 years) 50% employer subsidized
- after retirement		
pension	As before retirement	Depending on option selected
insurance	Varies to a maximum of $5,000	Nil
Disability benefit:		
- pension benefits	Accrued pension after 10 years' service	Accrued pension after 10 years
- income insurance	Various long-term disability plans in municipalities with continuing pension accrual	66.6% to a maximum of $2,500 monthly for management; 75% for union members. Employer paid
Portability	Reciprocal agreements with Ontario Government, Federal Government, Colleges of Applied Arts and Technology and a couple of provinces	With Metro Toronto Plan
Fund Investments	Provincial debentures only up to 1975. From 1975 new monies are invested in the market as well as provincial debentures	Diversified market
Plan administration:		
- responsibility	OMERS board	Employer
- financing	Fund income	Fund income

Table 2.2 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Municipal

	Ontario Municipal Employees Retirement System	Toronto Transit Commission
Collective bargaining - formal	Basic plan benefits are not negotiable. Employees in municipalities may negotiate supplementary benefits as well as the amount of the employer subsidy	No
- other bargaining unit input	There are 4 union representatives on the 11-man board	Pension Committee of 4 management and 4 union members
Auditing practice	The OMERS board reports to the Treasurer each year. Audited by Cooper and Lybrand, chartered accountants	Audited by Price, Waterhouse and Company
Special conditions	1. OMERS has a basic overall plan. It also has supplementary plans providing for purchase of past service and early retirement for which each municipality may opt, paying additional contributions depending on the benefits chosen. Employees can negotiate participation in these plans and the employer subsidy 2. Certain part-time employees can be deemed to be continuous full-time employees for pension purposes. These categories include elected municipal officials if the municipality has chosen to have the officials participate. Librarians and school board employees who work 10 months a year on a regular basis (which for teachers is a full year) are also in this group	Red-circled employees aged 50 or over and with 5 or more years in previous job are permitted to contribute at previous job rate

Summary of Smaller Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Municipal

Closed Plans:

These plans have been closed to new members from July 1965 or in accordance with Section 8 of the OMERS Act. All new members contribute to OMERS.

Metro Toronto main plan consists of 11 smaller plans with a total of 3,813 active members. Two of the plans with 2,100 members are on a 2% per year best 5 year average earnings formula. Employee contributions are

Table 2.2 (continued)
Summary of Smaller Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Municipal

6.5% including CPP. Nine of the plans are updated career average plans, updated to 1971, or provide a 1.33% per year best 5-year average earnings formula stacked or integrated. Contributions range from 3.5% to 4.5% up to the YMPE, and 5% to 6% above YMPE.

Metro Police have a 2.2% per year career average plan updated to 1972 with a minimum guarantee of a 1.5% per year best 5-year average earnings formula. Contributions are 7% of salary including CPP. Normal retirement age is 60. The plan is similar to OMERS prior to changeover to the best 5 formula as of January 1, 1978, except that the CPP offset of .6% is applied only for service after January 1970. There was an ad hoc escalation when the plan was upgraded and in 1975 a further increase of 2.5% for each year of retirement. A recent arbitration award has updated the salary base to 1976. This plan provides for employer and employees to share the cost of residual deficiency payments.

City of Toronto Civic Employees have a best 5-year average earnings formula. Employee contributions are 6.6% including CPP to November 1974 and 7% including CPP after that date.

City of Toronto Firemen have an average best 5-year earnings formula. Contributions are 7.5% including CPP contributions. They have a provision for early retirement of 50 years of age with 30 years of service.

City of Ottawa have an average best 5-year earnings formula which is the same as the new OMERS formula effective January 1, 1978. However, the City of Ottawa had this many years earlier. Employee contributions are based on attained age with a maximum of 8% including CPP.

Town of Mimico. The pension plan has 26 members on the career average basis, and benefits accrue at 2.5% per year for the first 20 years and .5% for each year thereafter for employees hired prior to January 1, 1953. After this date benefits are accrued at 1.5% per year. The maximum permitted is 60% of last 3 years' earnings. Contributions are 6% for firemen and 5% for other employees, and normal retirement is 60 and 65 respectively.

New Toronto. There are 36 employees still in the pension plan. Benefits are accrued on a similar basis to the Town of Mimico with slight variations. Contributions are 5% and benefits are also slightly lower than those for Mimico.

Regional Municipality of Hamilton-Wentworth: Benefits are based on a 2% per year best 5-year average formula, integrated with CPP. Employee contributions are 6.5% of salary for firemen and policemen who retire at age 60, and 5.75% for other employees, and do not include contributions to CPP. Post-retirement adjustments are on an ad hoc basis.

York Employees' Pension and Benefit Plan: Benefits are based on a 2% per year best 5-year average formula, integrated with CPP. Employee contributions are 6.5% for firemen, who retire at age 60, and 6% for other employees, including CPP. Post-retirement adjustments are made on an ad hoc basis.

Table 2.2 (concluded)
Summary of Smaller Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Municipal

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Open Plan:

Ottawa-Carleton Regional Transit Commission money-purchase plan. Employees contribute 5% less CPP. Data on employer contributions are available only for 1976 and they appear to be very low: 14% of employee contributions.

A final earnings benefit for designated executives has recently been introduced.

Other Plans:

All other plans in this sub-sector have very limited membership and are on a money purchase basis.

Table 2.3
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Health

	Hospitals of Ontario Pension Plan
Enabling legislation	Section 32 of the Health Insurance Act 1972 provides general authority for the flow of provincial funds
Date established	1960
Type of plan	Average best earnings
Eligibility conditions:	
- included	All permanent full-time employees of a member hospital may join after 6 months continuous service and must join after 2 years
- excluded	Part-time employees except those who are "deemed" to be full-time by the employing hospital
Employee contributions	4.5% YMPE - 6% above YMPE
Employer contributions	Balance required to fund. Currently 1.58% of employee contributions
Vesting conditions	10 years' service
Unit of pension benefit	2% less CPP offset
Earnings base for pension	Best 5-year average
Integration with CPP	.6% offset up to average of final 3-year YMPE for service from January 1966
Maximum pension as % of earnings base	70% less CPP offset
Retirement conditions and benefit:	
- normal retirement	Age 65
- early retirement unreduced	62 years of age with 20 years of service
- early retirement reduced	Reduced by 1/2 of 1% for each month earlier than 65 to age 55
Post-retirement indexation provisions	Nil
Additional voluntary contributions	To purchase additional pension
Options	If survivor and orphans' benefit is applicable there is no option. If not, there are life annuities with 5 and 10 year guarantees available, also integration with OAS
Survivor benefits:	
- before retirement pension	10 or more years' service - 50% of accrued pension. Less than 10 years - return of contributions with interest
insurance	$3,000 or twice salary. Average of 80% of premiums paid by employer.
- after retirement pension	50% of pension
insurance	$3,000 or if service less than 15 years, $200 for each completed year of service

Table 2.3 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Health

	Hospitals of Ontario Pension Plan
Disability benefit	
- pension benefits	If 45 with 10 years of service, normal pension calculation is reduced by 1/4 of 1% for each month prior to age 62
- income insurance	60% of salary
Portability	Reciprocal agreements with the Ontario Government, the Federal Government, the Colleges of Applied Arts and Technology, and 5 hospitals not in HOOPP
Fund investments	Market diversified
Plan administration:	
- responsibility	Employer association
- financing	Fund income
Collective bargaining:	
- formal	None
- other bargaining input	None
Auditing practice	Audited by Clarkson, Gordon and Company, chartered accountants
Special conditions	The .6% offset for CPP provides a better benefit than most other plans in the public sector. Pensions are provided for retirement at 65 even if employee has less than 10 years of service. Additional pension may be purchased with voluntary contributions at time of retirement

Summary of Smaller Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Health

Kitchener-Waterloo Hospital: The major features are similar to the Hospitals of Ontario Pension Plan.

Kingston General part-time employees: Kingston General belongs to HOOPP for its full-time employees, but it has established a separate plan with the same benefits for designated part-time employees.

Hospital for Sick Children: The plan is separate from HOOPP, but generally the main features are the same. Ad hoc escalation payments have been provided by the employer.

Toronto Western Hospital: The major features are similar to HOOPP.

Ontario Cancer Institute: The plan is quite different from plans in the hospital field. It provides a benefit based on the better of a money-purchase plan or a best 5-year average. It has a 3 year vesting period and has a CPP offset of .5% of the final 5-year average for service from 1966. There have been 2 ad hoc escalation adjustments provided by the employer.

Table 2.3 (concluded)
Summary of Smaller Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Health

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Sunnybrook Hospital: The bulk of the employees belong to the Hospitals of Ontario Pension Plan. However, there is a closed plan for less than 200 employees who were once employed in the federal civil service. Contributions are 6.5% including CPP. Normal retirement age is 60 with 5 years' service. The earnings base for the pension is the best 6-year average. There is no indexing.

Other Plans:

Two more plans in this sub-sector are on a money purchase basis.

Table 2.4
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education

	Teachers' Superannuation Fund
Enabling legislation	Teachers' Superannuation Act - Detailed Plan Provisions, Superannuation Adjustment Benefits Act
Date established	1917
Type of plan	Average best earnings
Eligibility conditions:	
- included	Holder of a teaching certificate and employed as a teacher or full time in any capacity by a school board, a ministry, a teachers' association, a trustee association or similar organization defined in the Teachers' Superannuation Act
- excluded	Employees who teach less than 20 days in a year
Employee contributions	7% including CPP and adjustment fund
Employer contributions	Matching employees. Amortization of deficiencies is made under OPB Act.
Vesting conditions	10 years pension credit
Unit of pension benefit	2% less CPP offset
Earnings base for pension	Best 7-year average
Integration with CPP	.7% offset up to YMPE in final year of service from January 1966
Maximum pension as % of earnings base	70% less CPP offset
Retirement conditions and benefit:	
- normal retirement	65 with 10 years
- early retirement unreduced	Age + service = 90
- early retirement reduced	55 years of age with 30 years of service reduced by 5% for each year less than 62. If less than 30 years of service reduced by 5% for each year less than 65
Post-retirement indexation provisions:	
- benefit	Ad hoc 1971-75. Regular annual from 1976 based on CPI with ceiling of 8%
- funding	For employees who retired prior to 1976 indexing funded by employer. For employees who retired in 1976 and later, funding shared equally by employer and employees
Options	Early retirement
Survivor benefits:	
- before retirement	
pension	10 or more years' service - 50% of accrued pension. Less than 10 years - return of contributions with interest
insurance	Varies with boards with 3 times annual salary wholly paid by the employer as upper limit

Table 2.4 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education

	Teachers' Superannuation Fund
Survivor benefits: (continued)	
- after retirement pension	50% of pension
insurance	Varies with boards
Disability benefit:	
- pension benefits	10 or more years' service - accrued pension - see Special Conditions for partial disability
- income insurance	Long-term disability plans, including pension accruals. Coverage may vary with boards
Portability	Reciprocal agreements with other teacher jurisdictions in Canada, public sector in Ontario, various other educational institutions. Otherwise refunds of single contributions with interest. Deferred annuities where applicable
Fund investments	Non-marketable Ontario Debentures
Plan administration:	
- responsibility	The Teachers' Superannuation Commission is responsible for the administration of the Teachers' Superannuation Act and reports to the Minister of Education. The day to day administration is delegated to the Teachers' Superannuation Commission, 6 appointed by the minister, 5 elected by teachers' organizations
- financing	Salaries and expenses paid out of fund
Collective bargaining:	
- formal	No
- other bargaining input	Ontario Teachers' Federation discusses change to act directly with the Minister of Education
Audit practice	Audited by the Provincial Auditor or as designated by him
Special conditions	1. Teachers can leave money in the fund even with less than 10 years' service, return to work and have continuous service for all purposes. 2. Partial disability (i.e., disabled for teaching, but not other professions) to commence at any age with 10 years' service. Maximum reduction of 25% (.5% for each year less than 65). 3. Earnings base for pension is the best 7-year average. Most other public sector plans on a final average basis are on best 5 years. 4. Teachers who become members of the council of a municipality, the Legislative Assembly of Ontario, or the House of Commons of Canada, may make contributions for this service if they are again employed as teachers for not less than 20 school days in a year. This does not prohibit them from membership in the pension plans of these institutions for the same period.

Table 2.4 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education

	Teachers' Superannuation Fund
Special conditions (continued)	
	5. In addition to unpaid periods of absence for such matters as pregnancy, compassionate leave, etc., in respect of which most plans permit members to contribute, teachers may also contribute for periods of travel, study, or sabbatical leave for up to 2 years.

Colleges of Applied Arts and Technology The benefit is based on the best 7 years' salary, 2% per year less the CPP offset. The plan is generally similar to the Teachers' Superannuation Fund, except that ad hoc post retirement benefits are paid entirely by the employer. It has very few pensioners compared to contributors as it is a relatively new plan, commencing in 1966. The plan provides for early retirement on unreduced pension at age 60 plus 20 years' service and when the total of age and service equals 90.

	University of Toronto	Queen's University
Enabling legislation	Act establishing university provides general authority for expenditure of funds	Act establishing university provides general authority for expenditure of funds
Date established	1919	Revised Plan 1969
Type of plan	Average best earnings	Money purchase - variable annuities with minimum final earnings guarantee
Eligibility conditions:		
- included	Full-time academics, administrative and support staff from age 25. Part-time academics if earning more than 40% of YMPE	Full-time academic, administrative, and support staff from age 25
Employee contributions	Full-time service: 2.5% to YMPE and 5% over Part-time service: 5%	4.5% to YMPE and 6% over YMPE
Employer contributions	Balance required	Balance required
Vesting conditions	10 years' service except for transfer to RRSP and other plans - see special conditions	Immediate
Unit of pension benefit	Under 45 - .75% to YMPE, 1.5% over YMPE over 45 - 1% to YMPE, 2% over YMPE	Variable annuity with minimum guarantee of 1.3% of the average best 5 years to YMPE + 1.75% over YMPE per year of service
Earnings base for pension	Best 5-year average	Minimum guarantee based on best 5-year average

Table 2.4 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education

	University of Toronto	Queen's University
Integration with CPP	As described under Unit of Pension Benefit	As described under "Unit of Pension Benefit"
Maximum pension as % of earnings base	In accordance with Department of National Revenue Regulations	In accordance with Department of National Revenue Regulations
Retirement conditions and benefit:		
- normal retirement	Age 65	Age 65
- early retirement unreduced	Age 60 only with agreement by board	Not applicable
- early retirement reduced	5% for each year less than 65 to age 55	Earlier than age 65 to age 55 - minimum guarantee is actuarially reduced
Post-retirement indexation provisions:		
- benefit	Ad hoc	Ad hoc
- funding	Fund income	Fund income
Options	Life with 5, 10, 15 years guaranteed, last survivor and level income options	Life with 5, 10, 15 years guaranteed, last survivor and level income options
Additional voluntary contributions	To purchase above options	To purchase above options
Survivor benefits:		
- before retirement		
pension	10 or more years' service -1/2 accrued pension. Less than 10 years - return of contributions with interest - double if married, single if not	Twice member's contributions + interest
insurance	Compulsory: 1 x salary) 100% employer Voluntary: 1 x salary) 48% employer 2 x salary) subsidy	Voluntary: 1 x salary 55% employer subsidy 3 x salary (with dependents) - 55% employer subsidy
- after retirement		
pension	One-half to widow or children under 21. 5-year guarantee applies otherwise	In accordance with option chosen
Disability benefit:		
- pension benefits	With board approval, accrued pension if employee deemed to be unable to perform job and not entitled to long-term disability	Contributions paid to long-term disability

Table 2.4 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education

	University of Toronto	Queen's University
Disability benefit: (continued)		
- income insurance	Long-term disability - 70% of salary, maximum $36,000 with continued pension accrual	Voluntary: 65% to $7,200) 55% to $10,800) 3% COLA 40% on balance)
Portability	Reciprocal agreements with Ontario government, federal government, Teachers' Superannuation Fund. Employee and employer contributions + 4% compounded interest may be transferred to a locked-in RRSP or other employer's fund	Employee and employer contributions may be transferred to a locked-in RRSP or other employer's fund
Fund investments	Diversified market	Diversified market
Plan administration:		
- responsibility	Employer	Employer and employee with investment consultants
- financing	Fund income	Fund income. Records maintained by employer
Collective bargaining:		
- formal	No	No
- other bargaining input	Representatives of faculty and administrative staff associations are members of committee for making recommendations	Input by staff to pension committee
Auditing practice	No information	No information
Special conditions	1. Offset for CPP goes back for service prior to 1966. 2. Discrimination between service before and after age 45. 3. Part-time employees are included for pension purposes. 4. Full portability with employee and employer contributions transferred to registered pension plans, and RRSPs with the provision that they be locked-in.	The university plans have a number of features which are unique and Queen's is a leader. 1. Full portability of employee and employer contributions is available as long as the registered pension plans or registered retirement savings plans will lock-in the contributions. 2. A variable annuity referred to as the money purchase component with a minimum guarantee on a final 5-year average basis is the basic benefit provided. The minimum guarantee

Table 2.4 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education

	University of Toronto	Queen's University
Special conditions (continued)		has rarely been used as the variable annuity has been consistently paying more to date. 3. Queen's and other universities offset CPP for all service including the years prior to 1966.

Summary of Smaller Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education

University of Ottawa: The benefit is based on best 5 years' salary: 1.3% to YMPE; 2% over YMPE. The employer contribution is 6% integrated with CPP. Automatic indexing of 2%, employer paid.

McMaster University: The benefit is based on best 5 years' salary: 1.05% to YMPE + 1.5% over YMPE for service before age 45 + 1.4% to YMPE + 2% over YMPE for service after age 45.

The employee contribution is 5% integrated with CPP. Ad hoc pension escalation - employer paid. Regular part-time employees are covered from April 1975.

McMaster University - Hourly Staff: This is the only flat rate benefit non-contributory plan in the Ontario public sector. The benefit in 1977 is $5 per month per year of service for 2 groups and $5.25 for one group.

University of Waterloo: The benefit is based on best 5 years' salary: 1.3% to YMPE, 2% over YMPE. The employee contribution is 6.5% integrated with CPP. Automatic pension indexing to 5%, more if funds are available, employer paid.

York, Carleton, Laurentian, Windsor (faculty), Wilfrid Laurier, and Brock Universities: The benefits and contributions appear to be similar to those provided by Queen's University, except that Brock University does not apply the CPP offset to years prior to 1966.

University of Western Ontario: The plans for academic and administration employees are now money-purchase plans - the academic plan from July 1970 and the administration plan from May 1974. Final average salary guarantees are provided to members who were hired before these dates.

Huron College: Union members have an updated career average plan with a benefit of 1.75% per year of service. For non-union members the benefit is 1.5% to YMPE and 2% above YMPE. Employee contribution rate is 6%.

Algoma University College: Benefit is based on best 5 years. Benefit is .75% up to YMPE plus 1.75% over YMPE. Employee contributions are 2% up to YMPE and 5% over YMPE.

Lakehead University - Faculty: Based on best 5 years. Benefit is 1.1% to YMPE and 1.6% over YMPE prior to January 1, 1976 and 1.2% to YMPE and 1.75% over YMPE after January 1, 1976. Employee contributions are 6.5% less CPP.

Table 2.4 (concluded)
Summary of Smaller Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Education

University of Guelph Professional Staff and Ex-civil Service Staff: Both these plans provide for a benefit of 1.05% up to YMPE and 1.5% over YMPE for service up to age 45. Over age 45 the benefit is 1.4% to YMPE and 2% over the YMPE. The CPP offset is applied to all years of service prior to 1966. Employee contributions are 6% including CPP. Employees may transfer double contributions to a locked-in RRSP or other plan.

University of Guelph - Staff: Based on best 5 years. Benefits are .9% to YMPE plus 1.5% over YMPE. Contributions are 5% including CPP.

Trent University: Based on best 5 years. Benefits are 1% to YMPE and 2% over YMPE. Employee contributions are 3% to YMPE and 6% over YMPE.

This plan permits the transfer of double contributions even where they are not locked-in. An additional voluntary plan exists which the employer subsidizes at the rate of 118% of the employee's contribution.

Lakehead - Staff: Benefits guaranteed at twice member's contributions accumulated with credited interest. Employee contributions are 5% less contributions to CPP.

Ryerson Polytechnical Institute and Ontario Institute for Studies in Education: The benefits in both plans are based on best 5 years' salary. The Ryerson plan is administered by OMERS Board.

University of Windsor Retirement Plan: The benefit is based on best 5 years' salary. Unit of benefit is 1.28% to YMPE, 2% over YMPE.

Other Plans:

The remaining plans in this sub-sector are mostly for boards of education or colleges affiliated with universities. These plans are all on a money purchase basis, except that North York Board of Education and St. Michael's (Faculty) at the University of Toronto have updated career average plans.

Table 2.5
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Utilities

	Ontario Hydro Corporation	Ontario Northland Transportation Commission
Enabling legislation	The Power Corporation Act and Regulations - Detailed Plan Provisions	Detailed Plan Provision in regulations under Ontario Northland Transportation Act, Section 8
Date established	1923	1960
Type of plan	Average best earnings	Average best earnings
Eligibility conditions:		
- included	All regular employees immediately. Employees affiliated with office and Professional Employees International Union after 6 months' service	All regular employees immediately. Seasonal employees included after 6 months' cumulative service
- excluded	Temporary tradesmen (usually get pensions through union or welfare funds), probationary	All other non-permanent employees
Employee contributions	3.43% to YMPE - 5% above YMPE	6% including CPP
Employer contributions	Balance which amounted to 14.38% of payroll in 1976	Matching employees plus deficiencies
Vesting conditions	1 year for retirement, 10 years for disability	10 years pension credit
Unit of pension benefit	2% less CPP offset	Same as Hydro
Earnings base for pension	Best 5-year average	Same as Hydro
Integration with CPP	.625% offset up to average of final 5-year YMPE for service from January 1966	.7% offset up to average of final 5-year YMPE for service from January 1966
Maximum pension as % of earnings base	70% less CPP offset	Same as Hydro
Survivor benefits:		
- before retirement pension	10 or more years' service - 50% accrued pension. Less than 10 years - return of contributions with interest	Same as Hydro
insurance	Partly term and partly paid up. 1 x annual salary compulsory. Optional up to 2 or 3 x annual salary. Substantial subsidy by employer	Union employees - $9,000 Salaried employees single 1 x salary) employer paid married 2 x salary)
- after retirement pension	50% of pension	Same as Hydro

Table 2.5 (continued)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Utilities

	Ontario Hydro Corporation	Ontario Northland Transportation Commission
Survivor benefits: (continued)		
insurance	Average paid up insurance policy of $10-$12,000	Union - 60 years of age + 10 years' service - approximately $3,000 Management - varying amounts of paid up insurance depending on early retirement attainment age 70. At 65 can be $10,000 decreasing at 70.
- pension benefits	Accrued pension after 10 years'of service	Accrued pension after 10 years' service
- income insurance	60% of base earnings with continuing pension accruals	None
Portability	Reciprocal agreements with Ontario Government, the Federal Government, Governments of New Brunswick, Manitoba, and OMERS	None
Retirement conditions and benefit:		
- normal retirement	Age 65 - no minimum service requirement	Age 65 with 10 years' service
- early retirement unreduced	Age 60 for females hired prior to January 1976. Age 60 plus 25 years of service all employees	Age 55 plus years of service totalling 85 or more. Age 60 with 20 years of service
- early retirement reduced	(i) Age 55 + 25 years of service - small non-actuarial reduction from age 60 (ii) Age 55 + 15 years of service - small non-actuarial reduction from age 65 (iii) Females hired prior to January 1965 age 50 + 15 years of service - same as (ii)	None
Post-retirement indexation provisions:		
- benefit	Ad hoc 1971-1975 matching PSSF - have continued from 1976 to date at half rate of PSSF since no employee contributions are required	Ad hoc
- funding	Fund income	Fund income

Table 2.5 (concluded)
Summary of Major Plan Provisions - Ontario Public Sector Pension Plans, Sub-sector: Provincial Utilities

	Ontario Hydro Corporation	Ontario Northland Transportation Commission
Options	Early retirement	Early retirement
Fund investments	Diversified market	Diversified market
Plan administration:		
- responsibility	Employer	Employer
- financing	Employer	Employer - except expenses of employee representatives on board which are paid by fund
Collective bargaining:		
- formal	Yes	Yes
Auditing practice	Audited by Clarkson Gordon	Audited by Provincial Auditor
Special conditions	1. Early retirement. Nominal reduction. An employee with 15 years' service between 55 and 65 has a maximum reduction at 55 of 25% 2. Contributions are lowest in the public sector and some of the best benefits are provided 3. The .625% offset for CPP and the averaging of the YMPE for 5 years are better than most plans in the public sector 4. If re-employed after 1 year, no linking of past with future service is permitted	1. Contributions cease after 35 years 2. Unreduced early retirement at 85 points 3. Averaging of YMPE over 5 years

AGE, SEX, AND SERVICE PROFILE OF ONTARIO PUBLIC SECTOR PENSION PLAN MEMBERSHIP

Table 3 gives the age, sex, and pension service distribution of members of all Ontario public sector pension plans.

Tables 3.1, 3.2a, 3.2b, 3.3, 3.4, 3.4a, 3.4b, 3.5, 3.6a and 3.6b provide the age, sex, and pensionable service breakdown for the pension plans membership in the provincial government and agencies, municipal (open), municipal (closed), health, education (all plans), Teachers' Superannuation Fund and Colleges of Applied Arts and Technology, Ryerson Polytechnical Institute, universities, provincial utilities, Legislative Assembly, and Caucus Employees Plan respectively. These tables include part-time membership separately where information was available. "No breakdown" category was added to some of the tables in order that the total of each sub-sector matches the aggregate membership in each sub-sector.

Tables 3A, 3B, 3C, 3D, 3E, and 3F give the percentage distribution by length of pensionable service for each age and sex group separately for provincial government and agencies, municipal (open), municipal (closed), health, education, and provincial utilities respectively.

Table 3
Ontario Public Sector Pension Plan Active Members, All Sub-sectors, by Age and Sex, December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)	(Number)																							
Less than 5	190	608	6302	15447	14703	21140	7994	9061	4300	6127	2794	4333	2261	3143	1833	2238	1264	1255	662	435	96	53	42399	63840
5- 9			222	760	8321	15226	12611	9579	6377	5985	4375	4825	3479	4467	2880	3811	2362	2566	1469	1375	182	124	42278	46718
10-14					397	523	7089	5036	7903	3259	4296	2439	3373	2779	2786	2821	2351	2563	1804	1821	161	168	30160	21409
15-19							230	230	4440	2147	4234	1339	2728	1424	2212	1611	1803	1687	1388	1296	110	111	17145	9845
20-24									341	143	2939	1077	3507	932	2485	1083	1919	1161	1320	1043	92	81	12603	5520
25-29											213	74	2309	675	2960	552	1861	496	1057	483	99	39	8499	2319
30-34													155	64	1316	476	1665	406	680	255	46	17	3862	1218
35+														1	94	28	454	250	540	306	37	19	1125	604
Total	190	608	6524	16207	23421	36889	27924	23906	23361	17661	18851	14087	17812	13485	16566	12620	13679	10384	8920	7014	823	612	158071	153473
No service breakdown	0	0	200	670	735	1193	1289	1122	1316	872	1181	698	1077	660	971	579	806	353	486	177	63	27	8124	6381
																							Sex breakdown only	70782	36318
																							Sub-total	433119	
																							No breakdown	2977	
																							Total	456096	

Table 3.1
Ontario Public Sector Pension Plan Members, Provincial Government and Agencies, by Age and Sex, December 1977

Pension service (Years)	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
	(Number)																							
Less than 5	110	483	2501	4440	3956	3404	2246	1825	1367	1102	1060	930	1000	726	859	635	625	343	286	124	47	16	14057	14028
5- 9			142	434	3017	1900	2931	1282	1666	1012	1342	867	1182	896	1219	921	1071	639	677	356	50	13	13297	8320
10-14					241	183	1880	491	1653	379	1021	371	975	471	1088	615	1135	686	949	494	34	17	8976	3707
15-19							104	54	906	148	1124	163	920	250	968	409	954	543	827	407	17	8	5820	1982
20-24									165	33	777	106	966	124	862	195	754	244	596	231	17	1	4137	934
25-29											78	15	469	59	706	63	516	83	322	79	12	1	2103	300
30-34													53	16	440	41	550	40	229	31	5	2	1277	130
35+														1	35	4	132	29	136	42	11	1	314	77
Total	110	483	2643	4874	7214	5487	7161	3652	5757	2674	5402	2452	5565	2543	6177	2883	5737	2607	4022	1764	193	59	49981	29478

Sub-total	79459
No breakdown	427
Part-time	1
Total	79887

Table 3.2a
Ontario Public Sector Pension Plan Members, Municipal Open Plans, by Age and Sex, December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
(Years)	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
													(Number)											
Less than 5	13	13	511	141	1068	46	871	36	533	25	330	14	238	22	130	19	43	5	15	3	2		3754	324
5- 9			11	10	207	30	432	14	299	9	304	8	187	11	105	12	48	6	15	2	2		1610	102
10-14					7	3	195	14	344	6	314	6	220	4	184	1	79	1	18	7	9		1370	42
15-19							7	2	58	3	171	1	211	6	172	5	87	3	34		2		742	20
20-24									9	2	75	3	235	1	221	8	180	4	79		12		811	18
25-29											3	1	84	1	224	6	223	2	161	2	19	1	714	13
30-34													6	1	57	2	154		112	3	16	1	345	7
35+															7		32	1	39		6	1	84	2
Total	13	13	522	151	1282	79	1505	66	1243	45	1197	33	1181	46	1100	53	846	22	473	17	68	3	9430	528
(a)					14	31	9	12	2	11	2	5		7	2	11	3	3	1	3		1	33	84
OMERS(b)	5933 M		5604 F		20193 M		9683 F		14820 M		7225 F		16724 M		7794 F		12533 M		4967 F		407 M	147 F	70610	35420
																							80073	36032
																					Sub-total		116105	
																							46(c)	
																							701(d)	
																					Total		116852	

a Metro Association for Mentally Retarded breakdown by age and sex only.
b No breakdown available for 6 plans. Figure also includes part-time.
c OMERS breakdown available by sex and decennial age group only.
d Transfers into OMERS from Oshawa and Etobicoke plans on January 1, 1978.

Table 3.2b
Ontario Public Sector Pension Plan Members, Municipal Closed Plans, by Age and Sex, December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)											(Number)													
Less than 5		1							1						1				1				3	1
5- 9					30	1	33	2	3				5			3	3		3	2		1	77	9
10-14					19		545	53	416	45	300	54	245	71	179	70	127	51	56	31	4	4	1891	379
15-19							3	2	435	15	457	24	317	39	202	52	179	68	121	38	21	8	1735	246
20-24									19		307	6	569	14	378	32	339	35	237	36	35	2	1884	125
25-29											4		155	3	311	2	109	6	47	2	13	2	639	15
30-34															104		217	2	65	2	8		394	4
35+															2	1	17		24	2	7		50	3
Total		1			49	1	581	57	874	60	1068	84	1291	127	1177	160	991	162	554	113	88	17	6673	782
(a)							61	10	146	11	186	1	181	22	202	25	226	27	122	29	14	6	1138	131
																							7811	913
																					Sub-total		8724	
																							3439(b)	
																					Total		12163	

a Hamilton/Wentworth - breakdown by age only.
b No breakdowns available for 16 plans. Figure includes 5 part-time employees.

Table 3.3
Ontario Public Sector Pension Plan Members, Health Sub-sector, by Age and Sex, December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)	(Numbers)																							
Less than 5	13	38	529	4997	1082	6662	932	3140	592	2152	466	1805	402	1438	435	1091	335	661	251	230	34	29	5071	22243
5- 9			26	84	429	2635	697	2776	638	2382	532	2083	537	2094	493	1932	522	1408	431	792	90	79	4395	16265
10-14					22	50	194	513	269	828	203	756	293	1095	273	1281	332	1236	352	976	79	122	2017	6857
15-19							15	10	74	172	81	237	151	434	155	558	167	640	163	558	47	75	853	2684
20-24									4	5	56	71	77	170	163	329	150	471	152	463	11	58	613	1567
25-29											1	1	10	30	18	13	50	40	73	89	25	28	177	201
30+																3	6	3	4	5	5	7	15	18
Total	13	38	555	5081	1533	9347	1838	6439	1577	5539	1339	4953	1470	5261	1537	5207	1562	4459	1426	3113	291	398	13141(a)	49635(a)
																							165(b)	893(b)
Part-time																							7(c)	5(c)
Sub-total																							64048	
																							4644(d)	
No breakdown																							42	
Total																							69110	

a HOOPP data effective December 1976.
Ontario Cancer Institute June 1977.
b Kitchener-Waterloo Hospital data broken down differently so only total used.
c Kingston General Hospital has a separate plan for 9 designated part-time employees: 7 males, 2 females.
Ontario Cancer Institute includes in its plan 3 female part-time employees.
d HOOPP increase for 1977 and transfers from North York Branson Hospital on January 1, 1978.

Table 3.4
Ontario Public Sector Pension Plan Members, Education Sub-sector(a), by Age and Sex, December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)													(Number)											
Less than 5	5	25	1359	5205	6622	10609	2839	3879	1194	2753	616	1534	421	915	279	473	181	229	84	75	11	6	13611	25703
5- 9			16	210	3544	10304	7141	5339	3024	2501	1690	1812	1209	1401	799	895	535	479	279	215	38	27	18275	23183
10-14					49	258	3654	3835	4751	1950	2155	1201	1406	1097	878	807	573	567	357	303	29	25	13852	10043
15-19							77	153	2710	1763	2214	894	1018	672	611	563	346	413	202	286	18	20	7196	4764
20-24									67	90	1221	859	1124	599	510	483	234	379	131	302	7	20	3294	2732
25-29											52	50	747	552	752	430	320	332	124	295	7	6	2002	1665
30-34													39	42	419	410	439	341	140	207	4	7	1041	1007
35+															15	19	175	212	248	253	10	16	448	500
Total	5	25	1375	5415	10215	21171	13711	13206	11746	9057	7948	6350	5964	5278	4263	4080	2803	2952	1565	1936	124	127	59719	69597
(b)			200	670	721	1162	1219	1100	1168	850	993	692	896	631	767	543	577	323	363	145	49	20	6953	6136
																							66672	75733
																						Sub-total	142405	
																						No breakdown	12089	
																						Part-time	210	
																						Total	154704	

a Although included in this statement, the following plans are also shown separately: TSF, Colleges, Universities, and Ryerson.
b Colleges, Ryerson, and OISE breakdown available only by age.

Table 3.4a
Ontario Public Sector Pension Plan Members, Education Sub-sector, Teachers' Superannuation Fund, by Age and Sex, December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)													(Number)											
Less than 5	3	13	1286	5079	6287	10272	2044	3389	636	2358	321	1241	202	671	90	282	49	110	20	32	5	4	10943	23451
5- 9			16	204	3483	10149	6679	5087	2107	2193	1010	1580	705	1131	444	632	223	298	77	101	15	14	14759	21389
10-14					45	245	3593	3797	4377	1840	1656	1104	961	992	544	661	313	416	156	208	8	14	11653	9277
15-19							77	153	2689	1757	2130	874	843	643	455	521	232	373	120	259	8	17	6554	4597
20-24									66	89	1207	856	1064	587	418	462	168	363	80	281	2	16	3005	2654
25-29											50	50	734	449	711	417	257	321	75	284	4	6	1831	1627
30-34													38	42	414	406	397	333	100	189	1	6	950	976
35+															14	19	172	210	215	246	5	16	406	491
Total	3	13	1302	5283	9815	20666	12393	12426	9875	8237	6374	5705	4547	4615	3090	3400	1811	2424	843	1600	48	93	50101	64462
(a)			185	618	671	1034	1104	956	1034	743	860	625	788	579	697	506	518	291	320	127	44	20	6221	5499
(b)			15	52	43	83	88	72	94	61	101	28	78	32	53	16	46	19	39	10	4		561	373
																					Total		127217	

a College of Applied Arts and Technology - no service breakdown available.
b Ryerson Polytechnical Institute - no service breakdown available.

Table 3.4b
Ontario Public Sector Pension Plan Members, Education Sub-sector, Universities, by Age and Sex, December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)													(Number)											
Less than 5	2	12	64	115	327	325	788	484	551	391	288	289	211	240	183	188	123	115	62	41	6	2	2605	2202
5- 9				4	61	136	455	248	914	305	669	231	494	268	345	258	305	175	199	111	23	13	3465	1749
10-14					4	7	60	36	360	109	491	97	435	96	315	139	246	145	189	95	21	11	2121	735
15-19									16	5	80	18	168	29	137	40	90	34	67	21	10	3	568	150
20-24										1	10	1	56	10	84	18	58	15	44	20	5	4	257	69
25-29											2		12	2	35	13	60	9	45	10	3		157	34
30-34													1		4	4	40	8	40	18	3	1	88	31
35+															1		3	1	32	7	5		41	8
Total	2	12	64	119	392	468	1303	768	1841	811	1540	636	1377	645	1104	660	925	502	678	323	76	34	9302	4978

Sub-total	14280
No breakdown(a)	11521
Part-time(b)	208
Total	26009

a Totals only available for 20 plans covering 11,520 members. For 11 plans date is for December, 1976.
b Part-time employees in University of Toronto Plan: 107 males, 101 females.

Table 3.5
Ontario Public Sector Pension Plan Members, Provincial Utilities, by Age and Sex,(a) December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)	(Numbers)																							
Less than 5	49	48	1398	655	1960	386	1091	164	600	84	313	41	188	35	118	14	75	10	24		1		5817	1437
5- 9			27	22	1094	353	1375	163	746	77	499	53	356	61	262	46	180	29	63	6	2	1	4604	811
10-14					59	29	620	130	470	51	299	51	228	39	180	46	100	22	68	9	3		2027	377
15-19							24	9	257	46	186	20	109	23	104	24	68	19	40	7	4		792	148
20-24									77	13	503	32	536	24	351	36	260	28	124	11	10		1861	144
25-29											75	7	844	30	949	38	643	33	330	16	23	1	2864	125
30-34													57	5	296	20	299	20	130	7	8		790	52
35+															35	4	98	8	93	9	3	1	229	22
Total	49	48	1425	677	3113	768	3110	466	2150	271	1875	204	2318	217	2295	228	1723	169	872	65	54	3	18984	3116
																					Total		22100	

a No sex breakdown provided for Ontario Northland Transportation Communication. Figures calculated based on total mix.

Table 3.6a
Ontario Public Sector Pension Plan Members, Provincial Legislature Sub-sector, Legislative Assembly Members, by Age and Sex, December 1977

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)												(Number)												
Less than 5					5		10		10	1	9		12		9		5	1	1		1	1	62	3
5- 9							1		1		8		3		2		3	2	1				19	2
10-14							1				4		6		4		5		4		3		27	
15-19											1		2				2		1		1		7	
20-24																	2		1				3	
25-29																								
30-34																								
35+																								
					5		12		11	1	22		23		15		17	3	8		5	1	118	5
																					Total		123	

Table 3.6b
Ontario Public Sector Pension Plan Members, Provincial Legislature Sub-sector, Caucus Employees, by Age and Sex, March 31, 1978

Pension service	Less than 20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 or more		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)												(Number)												
Less than 5			4	9	10	33	5	17	3	10		9		7	2	6		6		3		1	24	101
5- 9						3	1	3		4		2		4		2		3		2		3	1	26
10-14														2		1				1				4
15-19																		1						1
20-24																								
25-29																								
30-34																								
35+																								
Total			4	9	10	36	6	20	3	14		11		13	2	9		10		6		4	25	132

Total 157

Table 3A
Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Provincial Government Sub-sector, by Age and Length of Service, December 1977

Pension service	Less than 30		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)									(Per cent)									
Less than 5	65.9	76.8	31.4	50.0	23.7	41.2	19.6	37.9	18.0	28.5	13.9	22.0	10.9	13.2	7.1	7.0	24.4	27.1
5- 9	31.7	21.5	40.9	35.1	28.9	37.8	24.8	35.4	21.2	35.2	19.7	31.9	18.7	24.5	16.8	20.2	25.9	22.0
10-14	2.4	1.7	26.2	13.4	28.7	14.2	18.9	15.1	17.5	18.5	17.6	21.3	19.8	26.3	23.6	28.0	17.6	28.8
15-19	-	-	1.5	1.5	15.7	5.5	20.8	6.6	16.5	9.8	15.7	14.2	16.6	20.8	20.6	23.1	8.8	13.6
20-24	-	-	-	-	2.9	1.2	14.3	4.3	17.4	4.9	14.0	6.8	13.1	9.4	14.8	13.1	8.8	1.7
25-29	-	-	-	-	-	-	1.4	.6	8.4	2.3	11.4	2.2	9.0	3.2	8.0	4.5	6.2	1.7
30-34	-	-	-	-	-	-	-	-	1.0	.6	7.1	1.4	9.9	1.5	5.7	1.8	2.6	3.4
35+	-	-	-	-	-	-	-	-	-	-	.5	.1	2.3	1.1	3.4	2.4	5.7	1.7
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 3B
Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, by Age and Length of Service, Open Municipal Plans, December 1977

Pension service	Less than 30		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F(a)
(Years)									(Per cent)									
Less than 5	87.6	82.3	57.9	54.5	42.9	55.6	27.6	42.4	20.2	47.8	11.8	35.8	5.1	22.7	3.2	17.6	2.9	
5- 9	12.0	16.5	28.7	21.2	24.1	20.0	25.4	24.2	15.8	23.9	9.5	22.6	5.7	27.3	3.2	11.8	2.9	
10-14	.4	1.2	13.0	21.2	27.7	13.3	26.2	18.2	18.6	8.7	16.7	1.9	9.3	4.5	3.8	41.2	13.2	
15-19	-	-	.5	3.0	4.7	6.7	14.3	3.3	17.9	13.0	15.6	9.4	10.3	13.6	7.2	-	2.9	
20-24	-	-	-	-	.7	4.4	6.3	9.1	19.9	2.2	20.1	15.1	21.3	18.2	16.7	-	17.6	
25-29	-	-	-	-	-	-	.2	3.3	7.1	2.2	20.4	11.3	26.3	9.1	34.0	11.8	27.9	
30-34	-	-	-	-	-	-	-	-	.5	2.2	5.2	3.8	18.2	-	23.7	17.6	23.5	
35+	-	-	-	-	-	-	-	-	-	-	.6	-	3.8	4.5	8.2	-	8.8	
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

a Numbers too small to calculate.

Table 3C
Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Closed Municipal Plans, by Age and Length of Service, December 1977

Pension service	Less than 30		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)									(Per cent)									
Less than 5	-	(a)	-	-	.1	-	-	-	-	-	.1	-	-	-	.2	-	-	-
5- 9	61.2	(a)	5.7	3.5	.3	75.0	-	-	.4	-	-	1.9	.3	-	.5	1.8	-	-
10-14	38.8	-	93.8	93.0	47.6	25.0	28.1	64.3	19.0	55.9	15.2	43.8	12.8	35.1	10.1	27.4	4.5	(a)
15-19	-	-	.5	3.5	49.8	-	42.8	28.6	24.6	30.7	17.2	32.5	18.1	42.0	21.8	33.4	23.9	(a)
20-24	-	-	-	-	2.2	-	28.7	7.1	44.1	11.0	32.1	20.0	34.2	21.6	42.8	31.9	39.8	(a)
25-29	-	-	-	-	-	-	.4	-	12.0	2.4	26.4	1.3	11.0	3.7	8.5	1.8	14.8	(a)
30-34	-	-	-	-	-	-	-	-	-	-	8.8	-	21.9	1.2	11.7	1.8	9.1	(a)
35+	-	-	-	-	-	-	-	-	-	-	.2	.6	1.7	-	4.3	1.8	8.0	-
Total	100	(a)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	(a)

a Numbers too small to calculate.

Table 3D
Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Health Sub-sector, by Age and Length of Service, December 1977

Pension service	Less than 30		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)									(Per cent)									
Less than 5	77.3	80.9	50.7	48.8	37.5	38.9	34.8	36.4	27.3	27.3	28.3	21.0	21.4	14.8	17.6	7.4	11.7	7.3
5- 9	21.7	18.8	37.9	43.1	40.5	43.0	39.7	42.1	36.5	39.8	32.1	37.1	33.4	31.6	30.2	25.4	30.9	19.8
10-14	1.0	.3	10.6	8.0	17.1	14.9	15.2	15.3	19.9	20.8	17.8	24.6	21.2	27.7	24.7	31.4	27.1	30.7
15-19	-	-	.8	.1	4.7	3.1	6.0	4.8	10.3	8.2	10.1	10.7	10.7	14.4	11.4	17.9	16.2	18.8
20-24	-	-	-	-	.2	.1	4.2	1.4	5.2	3.2	10.6	6.3	9.6	10.6	10.7	14.9	3.8	14.6
25-29	-	-	-	-	-	-	.1	(a)	.7	.6	1.2	.2	3.2	.9	5.1	2.9	8.6	7.0
30-34	-	-	-	-	-	-	-	-	-	-	-	.1	.4	.1	.3	.2	1.7	1.8
35+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

a Less than .1 per cent.

Table 3E
Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Education Sub-sector, by Age and Length of Service, December 1977

Pension service	Less than 30		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
(Years)									(Per cent)									
Less than 5	68.9	59.5	20.7	29.4	10.2	30.4	7.8	24.2	7.1	17.3	6.5	11.6	6.5	7.8	5.4	3.9	8.9	4.7
5- 9	30.7	39.5	52.1	40.4	25.7	27.6	21.3	28.5	20.3	26.5	18.7	21.9	19.1	16.2	17.8	11.1	30.6	21.3
10-14	.4	1.0	26.7	29.0	40.4	21.5	27.1	18.9	23.6	20.8	20.6	19.8	20.4	19.2	22.8	15.7	23.4	19.7
15-19	-	-	.6	1.2	23.1	19.5	27.9	14.1	17.1	12.7	14.3	13.8	12.3	14.0	12.9	14.8	14.5	15.7
20-24	-	-	-	-	.6	1.0	15.4	13.5	18.8	11.3	12.0	11.8	8.3	12.8	8.4	15.6	5.6	15.7
25-29	-	-	-	-	-	-	.7	.8	12.5	10.5	17.6	10.5	11.4	11.2	7.9	15.1	5.6	4.7
30-34	-	-	-	-	-	-	-	-	.6	.8	9.8	10.0	15.7	11.6	8.9	10.7	3.2	5.5
35+	-	-	-	-	-	-	-	-	-	-	.4	.5	6.2	7.2	15.8	13.1	8.1	12.6
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 3F

Ontario Public Sector Pension Plans, Percentage Distribution of Active Membership, Provincial Utilities Sub-sector, by Age and Length of Service, December 1977

Pension service	Less than 30		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65 and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M(a)	F(a)
(Years)									(Per cent)									
Less than 5	74.3	72.9	35.1	35.2	27.9	31.0	16.7	20.1	8.1	16.1	5.1	6.1	4.4	5.9	2.8	-		
5- 9	24.4	25.1	44.2	35.0	34.7	28.4	26.6	26.0	15.4	28.1	11.4	20.2	10.4	17.2	7.2	9.2		
10-14	1.3	1.9	19.9	27.9	21.9	18.8	15.9	25.0	9.8	18.0	7.8	20.2	5.8	13.0	7.8	13.8		
15-19	-	-	.7	1.9	12.0	17.0	9.9	9.8	4.7	10.6	4.5	10.5	3.9	11.2	4.6	10.8		
20-24	-	-	-	-	3.6	4.8	26.8	15.7	23.1	11.1	15.3	15.8	15.1	16.6	14.2	16.9		
25-29	-	-	-	-	-	-	4.0	3.4	36.4	13.8	41.4	16.7	37.3	19.5	37.8	24.6		
30-34	-	-	-	-	-	-	-	-	2.5	2.3	12.9	8.8	17.4	11.8	14.9	10.8		
35+	-	-	-	-	-	-	-	-	-	-	1.5	1.8	5.7	4.7	10.6	13.8		
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		

a Numbers too small to calculate.

GROWTH OF PENSION PLAN MEMBERSHIP IN THE ONTARIO PUBLIC SECTOR

Tables 4.1 to 4.5 show the growth in pension plan membership since 1960 in each sub-sector based on the plans which provided such data. The annual percentage change in membership is also given where possible.

It can be seen from these tables that the growth rate in plan membership has declined since the early seventies. The high growth rate of some plans like the Ontario Municipal Retirement System and the Hospitals of Ontario Pension Plan in the late sixties reflect their absorption of many small plans in their respective fields.

Table 4.1
Ontario Public Sector Pension Plans, Active Membership Growth, Provincial Government Sub-sector, 1960-1977

	PSSF	Year to year percentage change	Sub-sector total(a)	Year to year percentage change
1977	76,712	2.2	79,476(b)	2.4
1976	75,065	- .4	77,623	- .3
1975	75,371	1.1	77,849	1.4
1974	74,540	2.5	76,770	2.6
1973	72,748	3.4	74,823	3.4
1972	70,379	2.4	72,339	2.5
1971	68,735	9.3	70,563	9.3
1970	62,888	8.7	64,538	8.5
1965	41,432	7.8	42,904	7.6
1960	28,413		29,768	

a Includes PSSF, WCB, Ontario Milk Marketing Board, Ontario Stock Yards Board, Ontario Educational Communications Authority, and the Royal Ontario Museum.

b Figure does not correspond to that in Table 1, because a different date was used.

Table 4.2
Ontario Public Sector Pension Plans, Active Membership Growth, Municipal Sub-sector, 1960-1977

	OMERS	Year to year percentage change	All municipal open(a)	Year to year percentage change	All municipal closed(b)	Year to year percentage change	Sub-sector total	Year to year percentage change
1977	106,030	3.5	114,475	3.5	10,795	- 5.2	125,270(c)	2.7
1976	102,432	5.3	110,627	5.0	11,393	- 6.0	122,020	3.9
1975	97,275	9.7	105,369	9.3	12,115	- 4.7	117,484	7.6
1974	88,708	5.8	96,425	5.6	12,711	- 8.5	109,136	3.7
1973	83,854	8.5	91,319	8.1	13,888	- 4.7	105,207	6.2
1972	77,258	6.3	84,503	6.1	14,571	- 4.7	99,074	4.4
1971	72,659	11.8	79,637	10.8	15,294	-10.4	94,931	6.7
1970	64,993	22.1	71,904	19.0	17,067	- 3.0	88,971	12.0
1965	23,918		30,131		20,290		50,421	
1960								

a OMERS, TTC, London Transit Commission, Halton, Otanabee, and Hamilton Conservation Authorities.
b Metro Toronto Employees, Metro Toronto Police, Borough of York, Guelph Transportation Commission, Long Point Regional Conservation Authority, Cities of Toronto (civic) and (firemen), North Bay, Oshawa and Ottawa, Town of Tilsonburg, Townships of Tay, Kingston, Rochester, Tuckersmith, London, and Melancthon.
c Figure does not correspond to that in Table 1 because a different date was used.

Table 4.3
Ontario Public Sector Pension Plans, Active Membership Growth, Health Sub-sector, 1960-1977

	HOOPP	Year to year percentage change	Sub-sector total(a)	Year to year percentage change
1977	63,000(E)	5.6	67,271(b)	5.5
1976	59,680	11.6	63,794	11.7
1975	53,474	5.1	57,114	5.3
1974	50,872	3.6	54,256	3.3
1973	49,098	3.6	52,505(E)	3.6
1972	47,409	11.0	50,681	11.2
1971	42,694	10.0	45,588(E)	
1970	38,819	11.0		
1965	23,942	16.9		
1960	10,988			

a HOOPP, Kingston General Hospital, The Hospital for Sick Children, Toronto Western Hospital, and Ontario Cancer Institute.

b Estimate. Also, figure does not correspond to that in Table 1 because a different date was used.

Table 4.4
Ontario Public Sector Pension Plans, Active Membership Growth, Education Sub-sector, 1960-1977

	TSF	Year to year percentage change	Universities(a)	Year to year percentage change	CAAT	Year to year percentage change	Sub-sector total(b)	Year to year percentage change
1977			22,257	2.2	11,931	1.7		
1976	139,138	1.4	21,787	2.9	11,731	3.7	172,707(c)	5.0
1975	137,280	4.2	21,177	- .3	11,307	2.2	164,411	.1
1974	131,808	-5.8	21,237	.6	11,060	9.5	164,180	-4.1
1973	139,971	16.8	21,119	7.3	10,097	21.9	171,264	16.3
1972	119,873	13.5	19,677(d)	5.4	8,282	16.4	147,926(d)	12.5
1971	105,657	13.6	18,664(d)	7.1	7,115	16.5	131,515(d)	12.8
1970	93,000	5.0	17,431(d)		6,107		116,617(d)	
1965	73,006	8.7						
1960	48,011							

a Data for universities include the following plans:
Queen's University, University of Ottawa, York University, Wilfrid Laurier University, King's College, Huron College, Laurentian University, Nipissing University College, McMaster University (contributory), Carleton University, University of Toronto, Algoma University, Waterloo University, Lakehead University, University of Guelph, Brock University, Ryerson Polytechnical Institute, and OISE.

b In addition to TSF, universities and CAAT, this includes 2 boards of education.

c Figure does not correspond to that in Table 1 because a different date was used.

d Carleton University did not provide data for these years.

Table 4.5
Ontario Public Sector Pension Plans, Active Membership Growth, Provincial Utilities Sub-sector, 1960-1977

	Hydro	Year to year percentage change	Sub-sector total(a)	Year to year percentage change
1977	19,555	1.0	21,285	1.0
1976	19,355	6.8	21,084	6.2
1975	18,126	3.8	19,856	2.8
1974	17,461	1.6	19,308	2.1
1973	17,187	.9	18,918	.7
1972	17,032	8.4	18,794	8.2
1971	15,711		17,373	
1970				
1965				
1960				

a Ontario Hydro and Ontario Northland Transportation Commission.

VESTING

Vesting refers to the entitlement of a member upon termination of his or her employment to a pension based on the plan formula in cases of a defined benefit plan. In cases of money-purchase plans, vesting refers to a member's entitlement to the employer's contribution on his or her behalf.

Table 5 classifies the pension plans according to their vesting conditions and shows the number of active members in each plan as of January 1, 1978 or the latest date for which the data are available. Because of lack of precise data on length of service and/or age of membership of many plans, it has not been possible to obtain a reliable estimate of vested members. Moreover because the length of service required for vesting varies from one day to 20 years, it is not considered meaningful to lump together vested members meeting different minimum vesting conditions.

Table 5
Ontario Public Sector Pension Plan Coverage, by Vesting Provisions(a)

	Active membership
Immediate vesting	
Ontario Municipal Employees Retirement System	106,731
Queen's University	1,863
Trent University	438
York University	1,977
Wilfrid Laurier University	397
Laurentian University	376
McMaster University - contributory	1,938
Carleton University	1,278
University of Windsor - faculty	660
- staff	564
University of Waterloo	2,008
Lakehead University - faculty	291
Brock University	455
Huron College	55
University of Western Ontario - academic	1,883
- administration	1,097
1-year vesting	
Hydro Pension Plan	20,478
3-year vesting	
The Ontario Cancer Institute	324
5-year vesting	
Ontario Educational Communications Authority	330
The Hospital for Sick Children	2,402
Algoma University College	35
8-year vesting	
Corporation of St. John's School - Elora	4
10-year vesting	
Public Service Superannuation Fund	76,712
Workmen's Compensation Board	2,264
City of Ottawa	1,013
Ottawa-Carleton Regional Transit Commission	1,468
Hospitals of Ontario Pension Plan	63,645
Kitchener-Waterloo Hospital	1,058
Toronto Western Hospital	1,252

Table 5 (concluded)
Ontario Public Sector Pension Plan Coverage, by Vesting Provisions(a)

10-year vesting (continued)	Active membership
Kingston General Hospital	9
Ryerson Polytechnical Institute	934
Ontario Institute for Studies in Education	435
University of Guelph Retirement Plan	749
- faculty	944
- staff	593
Teachers' Superannuation Fund	114,563
Colleges of Applied Arts and Technology	11,720
University of Toronto - ancillary staff plan	86
Ontario Northland Transportation Commission	1,622
15-year vesting	
Metroplitan Toronto Police	2,185
20 years' service or age 45 with 10 years	
Ontario Stock Yards Board	63
5 years' service and age 40	
University of Ottawa	1,742
Ontario Pension Benefits Act Requirements - 10 years' service and age 45	
Metropolitan Toronto Employees	3,813
City of Toronto - civic employees	2,282
City of Toronto - firemen	1,002
Borough of York Board of Education	427
Nipissing University College	28
Toronto Transit Commission	8,048
University of Toronto	5,452
Gradual vesting (range specified)	
Metropolitan Toronto Association for the Mentally Retarded (1 year 10 per cent - 10 years 100 per cent)	117
London Transit Authority (5 years 50 per cent - 10 years 100 per cent)	339
Lakehead University Staff (immediate 50 per cent - 10 years 100 per cent)	225
McMaster University - non-contributory (10 years 50 per cent 15 years 100 per cent)	277

a Information on the plans not listed above is not available. Smaller plans were not examined closely for the above purpose.

PENSION RECIPIENTS

Pension recipients or pensioners fall into three categories:

1. retirees (whether or not retired from public service),

2. survivors, and

3. disabled members.

Table 6 provides the distribution by age, sex, and year of retirement of pensioners from all the plans in the Ontario public sector.

Tables 6.1, 6.2a, 6.2b, 6.3, 6.4a, 6.4b, 6.5, and 6.6 give this distribution for pensioners in each sub-sector in the Ontario public sector.

It was not possible to separate the pensioner data by retirees, survivors, and disabled members because the plan sponsors were unable to provide or specify the figures for each category.

Table 6
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), all Sub-sectors, by Age, Sex, and Year of Retirement, December 1977

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		No age/sex breakdown	Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
1965 or earlier	8	42	3	93	49	292	111	626	356	1,334	794	1,808	870	1,821	1,289	9,496
1966-1970	26	222	76	233	226	840	799	1,947	1,831	2,430	508	619	29	129	1,553	11,468
1971	23	77	39	118	159	332	585	827	263	261	13	38	3	10	322	3,070
1972	50	93	74	184	403	659	765	929	173	134	13	13	4	12	288	3,794
1973	75	131	133	254	525	648	784	741	76	45	4	16	2	8	357	3,799
1974	100	140	163	318	466	557	730	538	39	26	9	8	5	16	364	3,479
1975	88	175	181	351	468	490	724	489	35	30	7	8	7	5	347	3,405
1976	115	221	330	329	977	766	375	229	26	33	5	16	3	7	482	3,914
1977	59	6	80	13	237	87	140	35	1	3	-	-	-	1	2,902	3,564
Total	544	1,107	1,079	1,893	3,510	4,671	5,013	6,361	2,800	4,296	1,353	2,526	923	2,009	7,904	45,989
No retirement year breakdown	12	4	14	6	64	13	222	71	124	33	47	11	26	1		648
													No age or retirement year breakdown			27,896
													Total			74,533(a)

a Pensioners as percentage of active members: 16.4.

Table 6.1
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Provincial Government Sub-sector, by Age, Sex, and Year of Retirement, December 1977

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1965 and earlier	2	29	1	72	35	181	40	319	150	475	389	626	371	644	3,334
1966-1970	13	156	57	175	102	332	345	487	1,145	750	274	217	3	18	4,074
1971	11	55	27	56	76	105	359	237	77	57	1	3	1		1,065
1972	32	65	39	65	165	133	403	282	36	29	3	1			1,253
1973	52	84	72	96	219	168	468	256	17	17		2		1	1,452
1974	54	92	83	87	207	150	426	200	7	4	2		1	1	1,314
1975	33	113	82	96	197	114	449	205	5	3					1,297
1976	38	103	191	132	680	323	108	59	2	8		1			1,645
1977	1	4		3	15	6	5	5		1				1	41
Total	236	701	552	782	1,696	1,512	2,603	2,050	1,439	1,344	669	850	376	665	15,475
No breakdown: 1977 net increase in PSSF															1,303
: others															2
Total															16,780(a)

a Pensioners as percentage of active members: 21.0.

Table 6.2a
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Closed Municipal Plans, by Age, Sex, and Year of Retirement, December 1977

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1965 and earlier	3		2		4		11		38		67	1	70	2	712(a)
1966-1970	3		7		13	1	12	1	44	4	16	3	3		384(a)
1971	3		2		4		12	2	45	7	6		1		82
1972	5		5		2		38	11	19		3				83
1973	9		6		13	4	44	13	18	2	1		1		111
1974	28		10		21	7	58	9	10				1		144
1975	25		9		22	11	59	17	5						148
1976	31		17		26	5	76	2	7	1					165
1977	34		24	7	61	20	25			1					172
Total	141		82	7	166	48	335	55	186	15	93	4	76	2	2,001(a)
Plans with no retirement year breakdown	12	1	12		61	2	91	7	56	7	26	8	24	1	308
													Sub total		2,309
													No breakdown		3,431
													Total		5,740(b)

a Includes pensioners for which no breakdown has been supplied prior to and including 1970.
b Pensioners as percentage of active members: 47.2.

Table 6.2b
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Open Municipal Plans, by Age, Sex, and Year of Retirement, December 1977

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1965 and earlier									1	1	53	8	141	4	208
1966-1970	1		2		3		16	6	136	11	105		11		291
1971	2		1		2	1	28	2	54	5	5				100
1972			2		2	1	52	4	20	1					82
1973	1		1		4	3	59	4	13						85
1974	1		3		43	2	89	3	9						150
1975	1		8		66	2	72	2	7						158
1976	3	1	15		42	1	43		6						111
1977	21	2	47	1	91	1	45								208
Total	30	3	79	1	253	11	404	21	246	18	163	8	152	4	1,393

Sub total	1,393
OMERS(a)	13,160
No breakdown - others	194
Total	14,747(b)

a No breakdown as above for OMERS.
b Pensioners as percentage of active members: 12.6.

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1965 and earlier				1		6	22	29							58
1966-1970				1	5	15	25	59							105
1971					4	16	4	8							32
1972				1	1	17	9	11							39
1973				1	2	16	5	13							37
1974					4	28	7	10							49
1975		1		3	3	21	5	10							43
1976				3	5	25	2	8							43
1977					7	23	2	7							39
Total		1		10	31	167	81	155							445

Sub total		445
No breakdown:	HOOPP	9,750
	: others	183
Total		10,378(a)

a Pensioners as percentage of active members: 15.0.

Table 6.4
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Total Education Sub-sector, by Age, Sex, and Year of Retirement, December 1977

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1965 and earlier	3	13		20	10	105	38	278	165	858	283	1,173	285	1,171	4,402
1966-1970	9	66	10	57	103	492	399	1,394	504	1,665	113	399	11	111	5,333
1971	7	22	8	62	65	210	181	578	86	192	1	34	1	10	1,457
1972	12	28	26	118	233	508	262	621	98	104	7	12	4	12	2,045
1973	13	47	53	157	287	457	205	455	25	26	3	14	1	7	1,750
1974	16	48	65	231	191	370	150	316	13	22	7	8	3	15	1,455
1975	21	61	76	252	173	342	137	255	15	27	7	8	6	5	1,385
1976	43	117	106	194	224	412	146	160	11	24	5	15	3	7	1,467
1977	1		7	2	61	37	60	23		1					192
Total	125	402	351	1,093	1,347	2,933	1,578	4,080	917	2,919	426	1,663	314	1,338	19,486
Plans with no retirement year breakdown		3	2	6	3	11	131	64	68	26	21	3	2		340
														Sub total	19,826
														No breakdown includes TSF net increase 1977	1,949
														Total	21,775(a)

a Pensioners as percentage of active members: 14.1.

Table 6.4a
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, Teachers and Colleges, by Age, Sex, and Year of Retirement, December 1977

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Teachers' Superannuation Fund															
1965 and earlier	3	13	0	20	10	105	37	277	161	853	275	1,146	222	1,123	4,245
1966-1970	9	66	6	57	63	478	376	1,376	431	1,625	28	357	6	106	4,984
1971	5	22	8	62	50	204	178	577	35	169	1	33	1	10	1,355
1972	12	28	25	117	216	499	244	612	18	67	7	12	4	12	1,873
1973	13	47	51	157	265	448	149	425	6	21	3	14		7	1,606
1974	16	48	65	230	159	357	88	279	4	20	7	8	3	15	1,299
1975	20	61	71	247	140	326	69	211	11	23	7	8	6	5	1,205
1976	42	117	101	188	193	392	36	91	10	21	5	14	3	7	1,220
1977(a)															
Total	120	402	327	1,078	1,096	2,809	1,177	3,848	676	2,799	333	1,592	245	1,285	17,787
CAAT		2		3	2	7	86	43	44	19	10	2	2		220
Ryerson		1	1	3		1	14	3	11	3	7	1			45
											Sub total				18,052
											TSF net increase 1977				1,182
											Total				19,234

a Not available.

Table 6.4b
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, Universities, by Age, Sex, and Year of Retirement, December 1977

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1965 and earlier							1	4	5	8	27	63	48		156
1966-1970			4		39	14	21	18	68	39	85	42	5	5	340
1971	2				15	6	3	1	49	23		1			100
1972			1	1	17	8	15	9	80	37					168
1973				1	20	9	55	30	19	5			1		140
1974				1	31	13	57	37	9	2					150
1975	1		5	5	33	16	62	40	4	4					170
1976	1		5	5	29	19	102	67	1	3		1			233
1977	1		7	2	56	35	60	23		1					185
Total	5		22	15	240	120	375	226	234	119	93	71	69	53	1,642
Plans with no retirement year breakdown			1		1	3	31	18	13	4	4				75
												Sub total			1,717
												No breakdown			633
												Total			2,350

Table 6.5
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Provincial Utilities Sub-sector, by Year of Retirement, December 1977(a)

	Ontario Northland Transportation Commission	Hydro Pension Plan	Total
1965 and earlier	163	612	775
1966-1970	107	1,169	1,276
1971	32	290	322
1972	32	256	288
1973	31	326	357
1974	41	323	364
1975	36	311	347
1976	38	444	482
1977	31	386	417
Total	511	4,117	4,628
		+ ONTC survivor's	409
		Total	5,037(b)

a Totals only - no breakdown available.
b Pensioners as percentage of active members: 22.8.

Table 6.6
Ontario Public Sector Pensioners (Retired, Disabled, and Survivors), Provincial Legislature Sub-sector(a), Legislative Assembly Members, by Age, Sex, and Year of Retirement, December 1977

Year of retirement	Less than 55		56-60		61-65		66-70		71-75		76-80		81 or more		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1965 and earlier									2		2		3		7
1966-1970							2		2				1		5
1971			1		8		1		1			1			12
1972	1		2				1								4
1973			1				3		3						7
1974	1		2												3
1975	8		6		7		2		3				1		27
1976			1												1
1977	2		2		2		3		1						10
Total	12		15		17		12		12		2	1	5		76(b)

a The Caucus Employees Retirement Plan was started in 1978 and has no pensioners.
b Pensioners as percentage of active members: 61.8.

GROWTH OF PENSIONERS

Tables 7.1 to 7.5 provide the growth in number of pensioners and the dollar value of pensions paid since 1960 to the pensioners from various plans in each sub-sector in the Ontario public sector.

The pension amounts given in this section include all pension payments channelled through the pension plans, but do not include any payments made to pensioners out of other monies of the employer, and not reported to the study.

Table 7.1
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Provincial Government Sub-sector, 1960-1977

	Public Service Superannuation Fund		Workmen's Compensation Board		Ontario Stock Yards		Royal Ontario Museum		Ontario Educational Communications Authority	
	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)
1977	16,376	65,484,000	365	1,420,160	24	41,000	13	4,633	3	4,815
1976	15,284	54,863,000	337	1,087,110	25	30,000	14	4,177	3	3,817
1975	14,084	45,107,000	301	1,152,060	24	28,000	14	4,177	1	1,688
1974	12,972	38,926,000	268	835,410	25	27,000	14	4,177	N/A	
1973	11,835	32,062,000	N/A		26	28,000	13	3,462	N/A	
1972	10,706	26,998,000	N/A		25	29,000	11	2,315	N/A	
1971	9,506	24,010,000	N/A		22	27,000	10	1,938	N/A	
1970	8,607	20,507,000	N/A		21	25,000	10	1,938	N/A	
1965	5,053	9,168,000	N/A		8	13,000	N/A		N/A	
1960	3,085	4,426,000	N/A		1	1,000	N/A		N/A	

Note Most plans were unable to separate retired employees from the total number of pensioners.

Table 7.2a
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Open Municipal Plans, 1960-1977

	Ontario Municipal Employees Retirement System		Toronto Transit Commission		London Transit Commission	
	(Number)	(Dollars)(a)	(Number)	(Dollars)	(Number)	(Dollars)
1977	13,160	16,660,000	1,422	N/A	47	73,000
1976	11,471	12,867,000	1,264	5,160,000	42	62,000
1975	9,821	8,983,000	1,219	4,485,000	37	51,000
1974	8,394	6,644,000	1,101	3,728,000	32	44,000
1973	6,908	4,612,000	1,009	2,953,000	27	35,000
1972	5,663	3,195,000	995	2,706,000	24	30,000
1971	4,592	2,117,000	968	2,463,000	20	21,000
1970	3,444	1,276,000	914	2,121,000	15	9,000
1965	358(a)	76,000	N/A	1,403,000	5	2,000
1960	N/A		N/A	1,070,000	2	1,000

Note Most plans were unable to separate retired employees from the total number of pensioners.

a These figures obtained from the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs and annual reports.

Table 7.2b
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Closed Municipal Plans, 1960-1977

	Mimico Pension Plan		New Toronto Pension Plan		City of Ottawa Superannuation Fund		Otanabee Region Conservation Authority		Metro Toronto and Region Conservation Authority	
	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)
1977		N/A		N/A	585	1,377,800	1	171	12	7,400
1976	18	53,810	21	60,975		N/A	1	171	10	7,000
1975		N/A		N/A		N/A	1	171	8	5,600
1974		N/A		N/A		N/A	1	171	6	3,500
1973		N/A		N/A		N/A	1	171	5	2,900
1972		N/A		N/A		N/A	1	171	3	2,000
1971		N/A		N/A		N/A		N/A	3	2,000
1970		N/A		N/A		N/A		N/A	3	500
1965		N/A		N/A		N/A		N/A		N/A
1960		N/A		N/A		N/A		N/A		N/A

Note Most plans were unable to separate retired employees from the total number of pensioners.

Table 7.2b (concluded)
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Closed Municipal Plans, 1960-1977

	Metro Toronto Pension Plan		Metro Toronto Police Benefit Fund		Toronto Civic Employees' Pension Plan		Toronto Fire Department Superannuation and Benefit Fund		York Borough Employees' Pension and Benefit Fund	
	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)
1977	1,308	2,784,953	801	3,921,444	1,687	5,202,000	489	1,876,000	147	548,000
1976	1,131	2,075,771	796	3,611,008	1,479	4,521,000	468	1,628,000	159	517,000
1975	1,061	1,666,831	726	3,024,670	1,354	3,541,000	448	1,276,000	147	479,000
1974	989	1,370,428	530	1,938,047	1,280	5,115,000	444	1,160,000	111	354,000
1973	895	894,868	484	1,529,838	1,198	2,706,000	395	1,142,000	106	314,000
1972	778	771,455	459	1,379,240	1,084	2,188,000	244	768,000	107	237,000
1971	722	669,228	474	1,556,809	1,018	2,086,000	289	729,000	N/A	331,000
1970	N/A		452	1,274,513	865	1,306,000	276	668,000	96	208,000
1965	N/A		479	925,853	840	1,146,000	251	475,000	N/A	
1960	N/A		505	806,206	710	970,000	204	334,000	N/A	

Note Most plans were unable to separate retired employees from the total number of pensioners.

Table 7.3
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Health Sub-sector, 1960-1977

	Hospitals of Ontario Pension Plan		Kitchener-Waterloo Hospital		Hospital for Sick Children		Toronto Western Hospital		Ontario Cancer Institute	
	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)
1977	9,750	9,182,000	123	110,933	322	616,000	131	125,276	52	87,082
1976	8,507	7,409,000	N/A	112,528	N/A		109	93,306	N/A	
1975	7,922	6,518,000	N/A	81,287	N/A		108	90,684	N/A	
1974	7,273	5,010,000	N/A	63,263	N/A		N/A		N/A	
1973	6,441	4,099,000	N/A	43,968	N/A		N/A		N/A	
1972	5,607	3,330,000	N/A	36,668	N/A		N/A		N/A	
1971	4,799	2,687,000	N/A	30,998	N/A		N/A		N/A	
1970	4,076	2,130,000	N/A	26,051	N/A		N/A		N/A	
1965	1,617	698,000	N/A		N/A		N/A		N/A	
1960	198	46,000	N/A		N/A		N/A			

Note Most plans were unable to separate retired employees from the total number of pensioners.

Table 7.4
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, 1960-1977

	Teachers' Superannuation Fund		Borough of York Board of Education		Perth County Board of Education		Trent University		University of Ottawa Retirement Pension Plan	
	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)
1977	18,969	116,458,000	46	20,000	N/A	8,315	19	36,763	97	145,000
1976	17,924	101,618,000	40	17,000	N/A	5,421	N/A		77	134,000
1975	17,113	102,077,000	28	14,000	N/A	3,872	N/A		62	94,000
1974	16,257	75,145,000	19	9,000	N/A	3,638	N/A		52	80,500
1973	15,245	62,762,000	14	7,000	N/A	3,118	N/A		41	58,000
1972	13,792	51,413,000	11	6,000	N/A	1,402	N/A		22	25,000
1971	12,217	43,937,000	8	4,000	N/A	1,402	N/A		14	17,500
1970	11,111	35,259,000	6	3,000	N/A	1,402	N/A		7	10,500
1965	7,002	15,787,000	N/A		N/A	262	N/A		N/A	
1960	4,836	8,395,000	N/A		N/A		N/A		N/A	

Note Most plans were unable to separate retired employees from the total number of pensioners.

Table 7.4 (continued)
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, 1960-1977

	York University		Wilfrid Laurier Staff Plan		University of Western Ontario Academic Plan		University of Western Ontario Administrative Plan		University of Toronto	
	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)
1977	80	97,000	17	39,000	59	N/A	201	N/A	903	3,007,000
1976	62	68,000	12	27,000	51	N/A	144	N/A	850	2,473,000
1975	52	53,000	7	21,000	45	N/A	116	N/A	777	1,845,000
1974	43	38,000	4	14,000	42	N/A	98	N/A	729	1,867,000
1973	28	22,000	N/A		37	N/A	85	N/A	N/A	
1972	19	12,000	N/A		31	N/A	72	N/A	646	1,705,000
1971	10	6,000	N/A		28	N/A	60	N/A	N/A	
1970	8	5,000	N/A		25	N/A	49	N/A	405	818,000
1965	0	0	N/A		10	N/A	21	N/A	265	578,000
1960	0	0	N/A		5	N/A	10	N/A	N/A	

Note Most plans were unable to separate retired employees from the total number of pensioners.

Table 7.4 (continued)
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, 1960-1977

	University of Waterloo		University of Guelph Retirement Plan		University of Guelph Professional Plan		University of Guelph Non-professional Plan		Brock University	
	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)	(Number)	(Dollars)
1977	177	208,200	219	451,000	61	396,000	33	11,000	19	35,800
1976	162	158,000	201	417,000	50	282,000	29	8,000	14	29,000
1975	124	114,000	181	366,000	42	219,000	27	6,000	13	24,800
1974	103	82,000	155	335,000	32	126,000	24	5,000	12	13,500
1973	77	61,000	137	295,000	9	53,000	22	4,000	10	7,000
1972	55	38,000	116	262,000	6	18,000	21	2,000	7	5,000
1971	34	24,000	97	223,000	2	11,000	17	1,000	N/A	
1970	20	10,000	(		N/A		(	N/A	N/A	
1965	N/A		(79	151,000	N/A		(9	N/A	N/A	
1960	N/A		(		N/A		(4	N/A	N/A	

Note Most plans were unable to separate retired employees from the total number of pensioners.

Table 7.4 (concluded)
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Education Sub-sector, 1960-1977

	Ryerson Polytechnical Institute		Colleges of Applied Arts and Technology	
	(Number)	(Dollars)	(Number)	(Dollars)
1977	45	76,053	N/A	
1976	41	61,903	220	260,017
1975	N/A		150	152,492
1974	N/A		N/A	
1973	N/A		N/A	
1972	N/A		N/A	
1971	N/A		N/A	
1970	N/A		N/A	
1965	N/A		N/A	
1960	N/A		N/A	

Note Most plans were unable to separate retired employees from the total number of pensioners.

Table 7.5
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Provincial Utilities Sub-sector, 1960-1977

	Ontario Hydro		Ontario Northland Transportation Commission	
	(Number)	(Dollars)	(Number)	(Dollars)
1977	4,172	20,568,000	930	3,044,000
1976	3,969	16,608,000	901	2,732,000
1975	3,693	13,829,000	884	2,443,000
1974	3,555	12,736,000	862	2,225,000
1973	3,350	10,661,000	839	2,036,000
1972	3,094(a)	8,645,000(a)	826	1,757,000
1971	2,921(a)	7,742,000(a)	807	1,779,000
1970	2,704(a)	6,237,000(a)	795	1,386,000
1965	N/A	3,592,000(a)	709	1,071,000
1960	N/A		590	708,000

Note Most plans were unable to separate retired employees from the total number of pensioners.
a These figures obtained from the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs.

Table 7.6
Ontario Public Sector, Total Payments to Pensioners (Retired, Disabled, and Survivors), Provincial Legislature Sub-sector, 1960-1977

	Legislative Assembly Retirement Plan	
	(Number)	(Dollars)
1977	76	673,800
1976	69	561,200

EMPLOYERS' PENSION COSTS

The costs referred to in this section are the year to year financial costs incurred by the employer to maintain the funding status of the plans.

Tables 8.1 to 8.5 provide the employer's costs from 1971 to 1977 for the various pension plans in each sub-sector. These costs include:

1. employer's current service costs;

2. employer's payments to liquidate actuarial deficiencies;

3. employer's payments to provide escalation of post-retirement pensions where reported to the study.

These costs do not include:

4. employer's contributions to the CPP;

5. employer's costs for administration of pension plans and escalation of post-retirement pensions which were not channelled through the pension fund.

The costs are given as a percentage of covered payroll so that cost comparison can be made across plans. A large number of plan sponsors supplied the dollar value of pension costs without providing data on the covered payroll. In such cases only those plans for which reliable cost estimates could be made were included in Tables 8.1 to 8.5.

Tables 8.6 to 8.10 give the annual employer's payments to pension plans to amortize actuarial deficiencies. These can vary substantially depending on the methods of funding and accounting of pension plan costs by the plan sponsors, and can only be compared in the context of total costs.

Covered or pensionable payroll refers to employer's payroll that is subject to pensions.

Table 8.1
Ontario Public Sector, Employer's Payments into Pension Plans, as a Percentage of Pensionable Payroll, Provincial Government and Agencies, 1971-1977(a)

	PSSF (inc. SABA)	Workmen's Compensation Board	Ontario Milk Marketing Board	Ontario Stock Yards Board	Ontario Educational Communications Authority
1977	9.94	9.05	.50	3.60	5.63
1976	9.60	13.90	1.20	3.70	N/A
1975	9.40	14.87	.80	4.50	6.12
1974	7.90	11.88	1.10	5.10	N/A
1973	8.20	11.20	1.20	6.70	10.37
1972	8.38	12.07	1.30	4.30	N/A
1971	9.24	9.64	1.30	5.00	10.19
Escalation costs included	Yes	Yes	No pension adjustments were made	No pension adjustments were made	Yes

a Ontario Research Foundation has not provided any data. Some plans provided some costs on a fiscal year basis and other costs on a calendar year basis. The above percentages represent an estimation on calendar year basis.

Table 8.2
Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Municipal Sub-sector, 1971-1977(a)

	OMERS	Ottawa/Carleton Reg. Transp. Commission	Metro Toronto employees	Metro Toronto police	City of Toronto (civic)	City of Toronto (firefighters)	Borough of York employees	City of Ottawa
1977	Please		10.62	7.26	26.48	21.60	11.2	9.35
1976		.7	5.58	7.55	21.51	21.05	11.1	8.80
1975	see	N/A	5.31	7.57	22.14	22.48	10.9	8.95
1974		N/A	5.33	7.63	10.23	11.66	10.5	8.72
1973	over	N/A	5.41	7.69	10.26	11.22	12.0	8.35
1972		N/A	5.45	7.71	9.04	9.37	12.0	9.94
1971		N/A	5.44	7.76	9.13	9.50	N/A	9.82
Escalation costs included	Yes		Yes	Yes	Yes	Yes	No	No

a Of the open plans, TTC, London Transit Authority, and Mental Retardation Associations did not provide the cost data. Of the closed plans with 300 or more members only Hamilton-Wentworth Regional Municipality plan did not provide the cost data. None of the closed small plans provided cost data.

Table 8.2 (concluded)
Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Municipal Sub-sector - 1971-1977

OMERS covers 1,006 municipal bodies. Different costs apply to each establishment based upon the amount of past service costs which the employer has agreed to pay, whether or not his employees belong to a supplementary plan, and upon the amount of subsidy he pays to supplementary plans. Administrators of OMERS were therefore not able to provide annual costs as a percentage of pensionable payroll, but they hope to be able to do so early in 1979.

In general, employer current service costs are as follows:

	1963-1977	1978
Basic plan - updated career average	4 per cent to YMPE 5.5 per cent above YMPE	
Additional for firemen and policemen who retire at 60	1 per cent	
Basic plan - final best 5 years		5.5 per cent to YMPE 7 per cent above YMPE
Additional for firemen and policemen who retire at 60		1 per cent

Supplementary plans	1969-1977	1978
Early retirement on unreduced pensions:		
1. Age 55 + 30 years of service	Up to 2 per cent	Up to 2 per cent
2. Age 50 + 30 years of service for firemen and policemen	Up to 2 per cent	Up to 2 per cent

The amount of employer subsidy to supplementary plans is negotiable.

Past service costs

In addition to the percentages shown above, employers are paying the past service costs required to provide for all years of service to be based on the updated career average or final average salary, depending on the year of retirement.

Table 8.3
Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Health Sub-sector, 1971-1977

	HOOPP	Kitchener-Waterloo General Hospital	Kingston General Hospital (part-time)	Hospital for Sick Children	Toronto Western Hospital	Ontario Cancer Institute
1977	7.69	7.69(E)	5.75	7.94(E)	N/A	8.74
1976	6.90	6.90(E)	5.75	7.94(E)	N/A	8.60
1975	7.19	7.19(E)	12.76	7.90(E)	7.67(E)	7.84
1974	6.49(E)	6.49(E)	7.19	7.71(E)	N/A	7.29
1973	6.67	5.92(E)	5.77	6.40(E)	N/A	8.28
1972	6.40(E)	5.67(E)	5.80	6.42(E)	N/A	8.43
1971	6.17	5.48(E)	5.81	N/A	N/A	8.65
Escalation costs included	No pension adjustments were made	No pension adjustments were made	No pension adjustments were made	Yes	No pension adjustments were made	No pension adjustments were made

E - Estimated by the study.

Table 8.4
Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Education Sub-sector, 1971-1977(a)

	Teachers' Superannuation Fund	Colleges of Applied Arts and Technology	University of Toronto	University of Waterloo	University of Western Ontario (academic plan)	York University	University of Ottawa	Queen's University	McMaster University (contributory plan)
1977	13.75(E)	5.14(E)	9.49	6.74(E)	7.97	7.06	8.83(E)	6.70(E)	9.91
1976	10.84(E)	5.19(E)	9.28	7.23	8.10	7.03	9.67	6.70(E)	9.77
1975	15.74(E)	5.17(E)	9.71	6.50(E)	10.65	7.03	9.67(E)	6.70(E)	9.70
1974	14.80(E)	5.45(E)	9.89	6.29	N/A	7.04	7.41	6.70(E)	9.66
1973	7.61(E)	N/A	N/A	N/A	N/A	7.04	N/A	6.70(E)	N/A
1972	8.65(E)	5.97(E)	10.24	N/A	N/A	7.03	N/A	N/A	N/A
1971	8.64(E)	6.00	N/A	N/A	N/A	6.48	N/A	N/A	N/A
Escalation costs included	Yes	No pension adjustments were made	No pension adjustments were made	Yes	Yes	Yes	Yes	Yes	Yes

E - Estimated by the study.
a Universities not shown on this list have not provided cost data. Some plans provided some costs on a fiscal year basis and other costs on a calendar year basis. The above percentages represent an estimation on calendar year basis.

Table 8.4 (concluded)
Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Education Sub-sector, 1971-1977(a)

	Carleton University	University of Western Ontario (admin. plan)	Ryerson Polytechnical Institute(b)	University of Guelph Professional Plan	University of Guelph Retirement Plan	University of Guelph Non-professional Plan	Wilfrid Laurier University
1977	7.67	8.78	5.87	10.27	7.40	3.46	5.73
1976	7.67	8.83	5.77(E)	9.78	7.82	3.45	5.36
1975	7.67	11.06	N/A	9.23	8.65	2.76	4.33
1974	7.67	N/A	4.98	7.50	6.60	2.63	2.94
1973	7.67	N/A	N/A	7.25	6.69	2.59	3.18
1972	N/A	N/A	N/A	8.68	10.43	2.60	3.15
1971	N/A	N/A	N/A	4.04	7.39	2.25	3.09
Escalation costs included	Yes	Yes	Yes	Yes	Yes	Yes	Yes

E - Estimated by the study.

a Universities not shown on this list have not provided cost data. Some plans provided some costs on a fiscal year basis and other costs on a calendar year basis. The above percentages represent an estimation on calendar year basis.

b Ryerson Polytechnical Institute's pension plan was designated under the Superannuation Adjustment Benefits Act in September 1977, and the employer and the employees started contributing 1 per cent each to the adjustment fund. The 1977 costs for the pension plan were estimated by the study.

Table 8.5
Ontario Public Sector, Employer's Payments into Pension Plan, as a Percentage of Pensionable Payroll, Provincial Utilities Sub-sector, 1971-1977

	Ontario Hydro Pension Plan	Ontario Northland Transportation Commission
1977	15.48(E)	20.23
1976	14.38	20.46
1975	11.96(E)	16.00
1974	12.18(E)	21.72
1973	12.89	15.40
1972	N/A	12.32
1971	14.23	11.45
Escalation costs included	Yes	Yes

E - Estimated by the study on the basis of the actuarial reports and other data.

Table 8.6
Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Provincial Government Sub-sector, 1971-1977

	PSSF	Workmen's Compensation Board	Ontario Milk Marketing Board	Ontario Stock Yards Board	Ontario Educational Communications Authority
1977	2.4	.00	0	.7	.46
1976	2.2	4.65	0	.8	N/A
1975	3.1	5.56	0	.9	.82
1974	1.9	2.64	0	1.2	N/A
1973	2.4	1.78	0	2.8	1.47
1972	2.6	1.97	0	.9	N/A
1971	3.4	.00	0	1.0	1.74

Table 8.7
Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Municipal Sub-sector, 1971-1977

	OMERS	Metro Toronto employees	Metro Toronto police	City of Toronto (civic)	City of Toronto (firefighters)	Borough of York employees	City of Ottawa
1977	0	5.62	.20	19.48	14.10	4.99	2.03
1976	0	.58	.54	14.51	13.55	5.64	1.90
1975	0	.31	.56	15.14	14.98	5.21	1.29
1974	0	.33	.63	3.63	4.55	5.18	1.56
1973	0	.41	.68	3.67	4.22	5.56	1.55
1972	0	.45	.71	2.44	2.37	5.68	1.57
1971	0	.44	1.08	2.53	2.50	N/A	2.41

Table 8.8
Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Health Sub-sector, 1971-1977

	Hospitals of Ontario Pension Plan	Kingston General Hospital	Hospital for Sick Children	Ontario Cancer Institute
1977	1.50	.0	1.4(E)	0
1976	.51	.0	1.5(E)	0
1975	.57	7.0	1.6(E)	0
1974	N/A	1.4	.7(E)	0
1973	.28	.0	.4(E)	0
1972	N/A	.0	.0(E)	0
1971	.38	.0	.0(E)	0

E - Estimate.

Table 8.9

Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Education Sub-sector, 1971-1977

	TSF	York Univ.	Wilfrid Laurier Univ.	McMaster University (contributory)	Univ. of Toronto	Univ. of Guelph (retirement)	Univ. of Guelph (prof.)	Univ. of Guelph (non-prof.)	Ryerson	Univ. of Waterloo	Univ. of Ottawa
1977	5.74(E)	1.81	2.23	N/A	1.55	2.02	4.48	.73	.99	.77	N/A
1976	1.69	1.78	1.88	.63	1.32	2.07	3.47	.90	.96	.03	2.60
1975	6.94	1.78	1.52	N/A	1.28	2.85	3.05	.70	N/A	N/A	.00
1974	7.52	1.79	.00	1.39	1.39	.96	1.22	.48	.31	N/A	.00
1973	.98	1.79	.00	N/A	N/A	1.19	1.23	.45	N/A	N/A	.00
1972	1.99	1.78	.00	N/A	1.31	2.88	3.15	.19	N/A	N/A	.00
1971	1.89	1.23	.00	N/A	N/A	.26	.01	.00	N/A	N/A	.00

E - Estimate.

Table 8.10
Ontario Public Sector, Employer Costs to Liquidate Actuarial Deficiencies, as a Percentage of Pensionable Payroll, Provincial Utilities Sub-sector, 1971-1977

	Ontario Hydro Pension Plan	Ontario Northland Transportation Commission
1977	5.6(E)	15.73
1976	5.18	15.96
1975	N/A	11.51
1974	N/A	17.22
1973	3.69	10.91
1972	N/A	7.81
1971	5.02	6.95

E - Estimate.

PENSION PLAN FUND ASSETS AND LIABILITIES

Tables 9.1 to 9.5 list the following for various plans in each sub-sector:

1. book and market value of pension plan assets and date of valuation;

2. actuarial liability and date of actuarial liability;

3. the ratio of assets/liabilities obtained by dividing the greater of book or market value by the actuarial liability of that plan.

This ratio measures the level to which the plan is funded to meet the liabilties.

Ratios in (3) were not calculated for those plans where the date of liability valuation did not coincide with the date of asset valuation. This disparity occurs because the two valuations are done independently. Assets are usually valuated by a plan's investment manager on a regular yearly basis, while liabilities have to be valuated every three years at least to meet the requirements of the Pension Commission of Ontario.

Moreover, this ratio was not calculated for the following types of plans:

1. Money-purchase plans: in such plans, liabilities arising from promised benefits always coincide with the assets value.

2. Modified money-purchase plans with a minimum guarantee: the actuarial liability in this type of plan refers to the minimum guarantee portion of the fund, the assets for which usually constitute a small fraction of the total assets.

Tables 9.6 to 9.10 show the liability assessed with regard to current pensioners in dollar terms, and as a proportion of the total liabilities of each plan for various plans in each sub-sector of the Ontario public sector.

A number of questions and up-dates to Tables 9.1 to 9.10 were made after the material was delivered to the Commission by Dr. Kelly. These changes have been incorporated in the tables that follow.

Table 9.1
Ontario Public Sector, Assets and Liabilities of Pension Plans, Provincial Government Sub-sector, as of December 31, 1977

Pension plan	Size of the fund		Liability of the fund(a)	Ratio of(b) assets/liability
	Book value	Market value		
	(Dollars)		(Dollars)	(Per cent)
Public Service Superannuation Fund	1,459,046,000(a)	Not applicable	1,870,261,000(f)	78
Workmen's Compensation Board	64,413,000	64,010,000 73,520,000(d)	54,520,000(f)	135(e)
Ontario Stock Yards Board	1,011,205	1,020,336	1,017,917	100
Ontario Educational Communications Authority	N/A	3,939,824	2,219,427(c)	

a As of December 31, 1978.
b The ratio of assets/liability is not calculated for plans where the assets and liability valuation dates are different.
c As of January 1, 1976.
d Actuarial value of fund assets on hand at December 31, 1977.
e Ratio of actuarial value of assets to liabilities.
f Liabilities are for accrual benefits only. Total liabilities on a projected benefit basis are $3,120,251,000 for PSSF and $98,632,000 for WCB.

Table 9.2
Ontario Public Sector, Assets and Liabilities of Pension Plans, Municipal Sub-sector, as of December 31, 1977

Pension plan	Size of the fund		Liability of the fund	Ratio of(a) assets/liability
	Book value	Market value		
	(Dollars)		(Dollars)	(Per cent)
City of Toronto (civic employees)	93,184,930	86,336,831	176,205,000(b)	
City of Toronto (firefighters)	55,517,962	50,690,725	74,823,200(b)	
Borough of York	16,635,175	15,920,662	30,629,000(c)	54
City of Ottawa	67,254,365	63,213,216	69,711,024	96
City of North Bay	587,784	633,676	N/A	
Nickel District Conservation Authority	7,752		Money purchase	
Hamilton Regional Conservation Authority	49,401		Money purchase	
Ontario Municipal Employees Retirement System	1,079,000,000	85% non-marketable	919,000,000(d)	117.4
Metro Toronto (civic)	117,463,796	114,243,044	250,682,032(f)	47
Metro Toronto police	108,321,940	99,915,201	215,313,572(f)	50
Town of Mimico	1,008,835(b)	N/A	2,112,475(b)(f)	47
Town of New Toronto	1,544,367(b)	N/A	2,713,117(b)(f)	57
Town of Tilsonburg	345,916(e)	365,924(e)	Money purchase	
Toronto Transit Commission	122,849,744(b)	117,531,180(b)	151,205,253(b)	81

a The ratio of assets/liability is not calculated for plans where the assets and liability valuation dates are different.
b As of December 31, 1976.
c As of January 1, 1978.
d The liability for OMERS has been calculated on a career average plan rather than the new final average plan in effect since January 1, 1978.
e As of July 31, 1977.
f Includes liability for future service.

Table 9.3
Ontario Public Sector, Assets and Liabilities of Pension Plans, Health Sub-sector, as of December 31, 1977

Pension plan	Size of the fund		Liability of the fund	Ratio of(a) assets/liability
	Book value	Market value		
	(Dollars)		(Dollars)	(Per cent)
Hospitals of Ontario Pension Plan	595,323,627 (748,196,000)(f)	604,483,812 (757,578,000)(g)	700,000,000 (831,389,000)	86 (91)
Kitchener-Waterloo Hospital	N/A	6,661,731	4,915,217(b)	
Kingston General Hospital (part-time employees)	243,009	252,381	189,986(b)	
Toronto Western Hospital	12,651,908	12,502,663	14,764,000	86
Ontario Cancer Institute	6,937,104(c)	6,937,104(c)	18,444,700(d)(e)	37
Hospital for Sick Children	28,242,763	28,747,739	30,453,361	94

a The ratio of assets/liability is not calculated for plans where the assets and liability valuation dates are different.
b As of December 31, 1976.
c As of June 30, 1977.
d As of July 1, 1977.
e Includes liability for future service.
f As of December 31, 1978.
g Actuarial value of fund assets on hand as of December 31, 1978.

Table 9.4
Ontario Public Sector, Assets and Liabilities of Pension Plans, Education Sub-sector

Pension plan	Size of the fund		Liability of the fund	Ratio of(a) assets/liability
	Book value	Market value		
	(Dollars)		(Dollars)	(Per cent)
Teachers' Superannuation Fund	3,370,512,000 as of December 31, 1978	Non-marketable	5,095,892,800 as of December 31, 1978	66
Queen's University	39,721,116 as of August 31, 1977	39,095,731	5,245,437(b)(c) as of August 31, 1975	
Trent University	5,440,082 as of July 1, 1977	5,539,668	6,182,713 as of July 1, 1977	88
Wilfrid Laurier University	6,502,000 as of December 31, 1977	6,740,000	2,774,675(b)(c) as of July 1, 1976	
University of Western Ontario - academic plan (1939)	31,652,214 as of December 31, 1977	31,760,879	28,473,898 as of July 1, 1977	
University of Western Ontario - administrative plan (1939)	11,758,130 as of December 31, 1977	11,797,745	9,943,512 as of May 1, 1977	
Laurentian University	5,636,265 as of December 31, 1977	5,373,337	6,609,676 as of June 30, 1978	
Nipissing University College	365,725 as of December 31, 1977	N/A	N/A	
Carleton University	30,391,659 as of December 31, 1977	30,789,415	8,381,311(b)(c) as of June 30, 1976	

a The ratio of assets/liability is not calculated for plans where the assets and liability valuation dates are different.
b Includes liability for future service.
c Refers to the minimum guarantee portion of the plans.

Table 9.4 (continued)
Ontario Public Sector, Assets and Liabilities of Pension Plans, Education Sub-sector

Pension plan	Size of the fund		Liability of the fund	Ratio of(a) assets/liability
	Book value	Market value		
	(Dollars)		(Dollars)	(Per cent)
York University	35,604,338 as of December 31, 1977	36,014,328	18,041,481(b)(c) as of December 31, 1976	
University of Ottawa	39,419,853 as of January 1, 1977	38,485,524	41,813,121 as of January 1, 1977	94
McMaster University (contributory plan)	43,350,940 as of December 31, 1977	43,122,284	124,379,488(b) as of June 30, 1977	
McMaster University (non-contributory plan)	804,777 as of December 31, 1977	776,244	850,474 as of June 30, 1977	
Algoma University College	558,331 as of June 30, 1978	576,763	301,171 as of July 1, 1978	192
King's College	187,124 as of December 31, 1977	188,216	Money purchase	

a The ratio of assets/liability is not calculated for plans where the assets and liability valuation dates are different.
b Includes liability for future service.
c Refers to the minimum guarantee portion of the plans.

Table 9.4 (concluded)
Ontario Public Sector, Assets and Liabilities of Pension Plans, Education Sub-sector

Pension plan	Size of the fund		Liability of the fund	Ratio of(a) assets/liability
	Book value	Market value		
	(Dollars)		(Dollars)	(Per cent)
University of Toronto (academic & admin. plan)	141,287,309 as of June 30, 1977	138,422,100	151,689,131 as of June 30, 1977	93
University of Waterloo	35,632,496 as of December 31, 1977	36,626,485	43,178,828 as of December 31, 1977	83
University of Guelph Retirement Plan	11,447,847 as of December 31, 1977	11,964,337(d)	23,177,200(b) as of December 31, 1977	52
University of Guelph Professional Plan	31,717,299 as of December 31, 1977	33,118,617(d)	74,389,202(b) as of December 31, 1977	45
University of Guelph Non-professional Plan	2,828,618 as of December 31, 1977	2,966,773(d)	8,169,660(b) as of December 31, 1977	36
Brock University	6,676,178 as of July 1, 1977	6,523,203	2,658,122(c) as of July 1, 1977	
Ryerson Polytechnical Institute	14,956,477 as of December 31, 1977	14,996,295	15,858,009 as of January 1, 1978	95
Ontario Institute for Studies in Education	N/A as of June 30, 1977	5,508,759	5,234,568 as of June 30, 1977	111
Colleges of Applied Arts and Technology	130,760,947 as of December 31, 1977	131,347,921	102,713,511 as of January 1, 1977	

a The ratio of assets/liability is not calculated for plans where the assets and liability valuation dates are different.
b Includes liability for future service.
c Refers to the minimum guarantee portion of the plans.
d Adjusted market value.

Table 9.5
Ontario Public Sector, Assets and Liabilities of Pension Plans, Provincial Utilities Sub-sector, as of December 31, 1977

Pension plan	Size of the fund		Liability of the fund	Ratio of(a) assets/liability
	Book value	Market value		
	(Dollars)		(Dollars)	(Per cent)
Ontario Hydro	970,563,000(d)	1,063,745,000	1,073,147,000	99
Ontario Northland Transportation Commission	53,549,590(d)		146,684,242(e)	37

a The ratio of assets/liability is not calculated for plans where the assets and liability valuation dates are different.
b As of December 31, 1976.
c As of December 31, 1975.
d All as of December 31, 1978.
e Includes liability for future service.

Table 9.6
Ontario Public Sector, Liability Data for Current Pensioners, Provincial Government Sub-sector

Pension plan	Liability for current pensioners	Ratio of liability for pensioners to total liabilities of the plan	Date of actuarial valuation
	(Dollars)	(Per cent)	
Public Service Superannuation Fund	473,364,000	25.31	December 31, 1978
Workmen's Compensation Board	13,824,000	25.24	December 31, 1977
Ontario Stock Yards Board	337,569	33.16	December 31, 1977
Ontario Educational Communications Authority	22,434	1.01	January 1, 1976

Table 9.7
Ontario Public Sector, Liability Data for Current Pensioners, Municipal Sub-sector

Pension plan	Liability for current pensioners	Ratio of liability for pensioners to total liabilities of the plan	Date of actuarial valuation
	(Dollars)	(Per cent)	
Ontario Municipal Employees Retirement System	195,000,000	21.22(E)	December 31, 1977
Metro Toronto employees	26,364,420	10.52(a)	December 31, 1977
Metro Toronto police	39,225,423	18.22(a)	December 31, 1977
City of Toronto civic employees	36,386,000	20.65	December 31, 1976
City of Toronto firemen	16,573,800	22.15	December 31, 1976
Borough of York employees	4,853,000	15.84	January 1, 1978
Mimico	514,911	24.37(a)	December 31, 1976
New Toronto	643,058	23.70(a)	December 31, 1976
Toronto Transit Commission	43,670,244	28.88	December 31, 1976

E - Estimate.
a Includes liability for future service.

Table 9.8
Ontario Public Sector, Liability Data for Current Pensioners, Health Sub-sector

Pension plan	Liability for current pensioners	Ratio of liability for pensioners to total liabilities of the plan	Date of actuarial valuation
	(Dollars)	(Per cent)	
Hospitals of Ontario Pension Plan	148,023,000	17.80	December 31, 1978
Toronto Western Hospital Plan	1,284,000	9.07	December 31, 1977
Hospital for Sick Children	4,931,265	16.2	December 31, 1977
Kingston General Hospital	0	0	December 31, 1976

Table 9.9
Ontario Public Sector, Liability Data for Current Pensioners, Education Sub-sector

Pension plan	Liability for current pensioners (Dollars)	Ratio of liability for pensioners to total liabilities of the plan (Per cent)	Date of actuarial valuation
Teachers' Superannuation Fund	905,635,000	17.77	December 31, 1978
Queen's University	333,344(a)(b)	6.35	August 31, 1975
Trent University	410,137	6.63	July 1, 1977
University of Ottawa	1,595,103	3.81	January 1, 1977
York University	674,911(a)(b)	3.74	December 31, 1976
Wilfrid Laurier University	64,875(a)(b)	2.34	July 1, 1976
University of Western Ontario (academic)	781,334	2.74	July 1, 1977
University of Western Ontario (administrative)	419,050	4.21	May 1, 1977
Laurentian University	22,352	.58	June, 1975
McMaster University (contributory)	2,371,803(b)	1.91	June 30, 1977
McMaster University (non-contributory)	150,552	17.70	June 30, 1977
Carleton University	48,324(a)(b)	.58	June 30, 1976
University of Toronto	32,146,126	21.19	June 30, 1977
University of Waterloo	2,665,682	6.17	December 31, 1977
Lakehead University - professional	23,256	.78	December 31, 1977
University of Guelph Retirement Plan	4,534,951(b)	19.57	December 31, 1977
University of Guelph Professional Plan	3,849,830(b)	5.18	December 31, 1977
University of Guelph Non-professional Plan	180,907(b)	2.21	December 31, 1977
Brock University	197,643(a)	7.44	July 1, 1977
Ryerson Polytechnical Institute	762,961	4.81	January 1, 1978
Colleges of Applied Arts and Technology	2,749,445	2.68	January 1, 1977
Algoma University College	40,200	13.35	December 31, 1978

a Refers to the minimum guarantee portion of the fund.
b Includes liability for future service.

Table 9.10
Ontario Public Sector, Liability Data for Current Pensioners, Provincial Utilities Sub-sector

Pension plan	Liability for current pensioners	Ratio of liability for pensioners to total liabilities of the plan	Date of actuarial valuation
	(Dollars)	(Per cent)	
Ontario Hydro Pension Plan	202,438,000	18.86	December 31, 1978
Ontario Northland Transportation Commission Pension Plan	33,040,564(a)	22.52	December 31, 1978

a Includes liability for future service.

The investments of the pension funds may be categorized as follows:

1. Provincial government liabilities: including deposits and/or debentures. Two funds (PSSF and TSF) are entirely within this category, while one fund (OMERS - including its two administered funds) has been so in the past, but is in the process of diversifying its portfolio by investing part of its new funds in the market. The assets of those funds are included in the table below.

2. Direct market investments: This category includes other large pension funds, e.g., Ontario Hydro, Hospitals of Ontario Pension Plan, university pension funds, etc., which have independent investment management policies. These funds are either invested through in-house groups or through a trust company. Thirty-three funds in this category are included in the table below.

3. Deposits with insurance companies: This category includes the assets of most of the smaller plans, and a few large ones. The table below includes the data on the plans which have only part of their funds invested with insurance companies. Very few plans with all their funds deposited with insurance companies have supplied the data which is as follows:

Sector	Number of funds	Dollars
Government	3	N/A
Health	1	6,937,104
Municipal	5	2,086,271
	19	N/A
Education	5	49,621,322
	9	N/A

Note Eighty-eight per cent of the funds in the education sector belongs to the two pension plans of the University of Western Ontario which are the only large plans to have invested their assets this way.

Table 10 presents the current assets and investment mix for each sub-sector based on the plans listed below:

Sub-sector:

Government:	Public Service Superannuation Fund, Workmen's Compensation Board, Ontario Stock Yards Board, Ontario Educational Communications Authority.
Health:	Hospitals of Ontario Pension Plan, Kitchener-Waterloo Hospital, Kingston General Hospital, Hospital for Sick Children, Toronto Western Hospital.
Municipal:	Ontario Municipal Employees Retirement Systems, Metro Toronto Employees, Metro Toronto Police, City of Toronto Employees, City of Toronto Firemen, Borough of York, City of Ottawa, Toronto Transit Commission.
Education:	Teachers' Superannuation Fund, Queen's University, Trent University, University of Ottawa, York University, Wilfrid Laurier University, Laurentian University, Algoma University College, McMaster University (2 plans), Carleton University, University of Toronto (administrative and academic plan), University of Waterloo, University of Guelph (3 plans), Brock University, Ryerson Polytechnical Institute, Colleges of Applied Arts and Technology.
Provincial Utilities:	Ontario Hydro, Ontario Northland Transportation Commission.

Table 10
Ontario Public Sector, Pension Fund Investment Portfolio, by Sub-sector, December 1977 or Latest Available Date(a)

Investment instrument	Government		Health		Municipal		Education		Utilities		Total	
	(Millions of dollars)	(Per cent)	(Millions of dollars)	(Per cent)	(Millions of dollars)	(Per cent)	(Millions of dollars)	(Per cent)	(Millions of dollars)	(Per cent)	(Millions of dollars)	(Per cent)
Debt (bonds)												
Public	29.6	2.1	88.8	13.8	230.2	14.1	26.6	.9	128.1	17.5	503.4	6.9
Private	18.9	1.4	191.1	29.7	196.7	12.0	83.2	2.9	132.4	18.0	622.3	8.5
Combined (no breakdown)							47.7	1.6			47.7	.7
Equity (stocks)	11.6	.8	185.9	28.9	122.0	7.4	163.5	5.6	233.6	31.9	716.6	9.8
Real estate					16.0	1.0	.6	(b)	.3	(b)	16.9	.2
Mortgages	7.9	.6	121.3	18.9	149.1	9.1	92.4	3.2	228.2	31.1	598.9	8.2
Other real estate and mortgage (no breakdown)							4.2	.1			4.2	.1
Short-term investments	1.3	.1	28.7	4.5	5.0	.3	22.3	.8	.7	.1	57.9	.8
Cash on hand	(b)	(b)	22.0	3.4	4.0	.2	8.4	.3	1.4	.2	35.8	.5
Other (accrued interest and net receivables)	(b)	(b)	.6	.1	2.1	.1	2.8	.1	8.9	.1	14.4	.2
Insurance company deposits			4.8	.7			1.8	.1			6.6	.1
Ontario treasury deposits/non marketable provincial debentures	1,324.0	95.0			913.3	55.7	2,457.8	84.2			4,695.2	64.1
Total(c)	1,393.4	100.0	643.1	100.0	1,638.5	100.0	2,911.4	100.0	733.6	100.0	7,319.9	100.0
Number of portfolios included	4		5		8		17		2		36	

a Figures summed do not correspond in all cases to the data in the assets and liabilities table as they could be for a different date. The other pension plans did not provide investment information regarding their portfolios.
b Indicates less than .1 per cent.
c Totals may not add due to rounding.

ANNUALIZED YIELDS OF PENSION FUNDS

Tables 11.1 to 11.5 show the annual yields for the period 1972-1977 of pension funds based on book or market value held by the same 36 plans included in Table 10. These yields were submitted by the plan sponsors in reply to the questionnaire which specified the method for their calculations as follows:

$$r = \frac{2 \quad |}{a + b - |}$$

where r = annualized rate of return
a = total fund at the beginning of a year
b = total fund at the end of the year
| = investment and interest income including capital gains and losses less the administration and other expenses in the year

It should be pointed out that the figures for the annual yield are taken directly from the questionnaire returns, and could not be independently verified.

Tables 11.1 to 11.5 also list the investment income in 1977 (or latest period available) for each plan. These figures were obtained from the financial statements or the actuarial valuations supplementing the returned questionnaires. In cases for which the 1977 investment income was not available, the figure for the latest period was used. Where investment income is for a period of more than a year, the figure used refers to the entire period and is not an annual average for that period.

Table 11.1
Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Provincial Government Sub-sector

Fund(a)	Percentage yield on fund						Book or market value	Investment income 1977	Years if not 1977
	1972	1973	1974	1975	1976	1977			
	(Per cent)							(Dollars)	
PSSF	6.00	6.30	6.59	7.08	7.56	7.94	Book	93,302,788	
WCB	5.49	5.17	5.60	5.98	6.81	7.32	Book	4,276,00	
Ontario Stock Yards Board	16.43	-6.62	-10.47	13.45	15.00	8.85	Book	225,288	1975-1977
Ontario Educational Communications Authority	13.57	-.25	-10.14	16.24	14.05	8.97	Market	N/A	

a The other pension plans did not provide information on investment returns.

Table 11.2
Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Municipal Sub-sector

Fund(a)	Percentage yield on fund						Book or market value	Investment income 1977	Years if not 1977
	1972	1973	1974	1975	1976	1977			
	(Per cent)							(Dollars)	
OMERS	7.72	7.74	8.07	8.48	8.92	9.10	Book	105,549,040	
Metro Toronto employees					8.01	8.37	Book		
Metro Toronto police					7.57	7.35	Book		
City of Toronto civic employees	5.17	5.25	5.79	5.77	6.18	6.56	Book	229,988	1976
City of Toronto firemen	4.92	5.03	5.11	5.54	5.70	6.49	Book	2,568,691	1976
Borough of York	7.5	7.7	7.6	8.4	8.6	8.8	Book	1,323,877	
City of Ottawa	6.79	6.77	6.20	6.83	7.63	6.83	Book	4,348,366	
Toronto Transit Commission	10.23	10.77	14.29	14.89	15.29		Book	7,753,852	1976

a The other pension plans did not provide information on investment returns.

Table 11.3
Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Health Sub-sector

Fund(a)	Percentage yield on fund						Book or market value	Investment income 1977	Years if not 1977
	1972	1973	1974	1975	1976	1977			
	(Per cent)							(Dollars)	
Hospitals of Ontario Pension Plan	4.7	6.7	4.4	6.8	7.5	8.1	Book(b)		
Kitchener-Waterloo Hospital	15.88	.30	-9.50	10.99	8.33	7.64	Market	256,911	
Kingston General Hospital	8.81	4.70	1.58	11.18	16.90		Book	34,714	1974-1976
Hospital for Sick Children	3.86	5.50	6.37	7.01	7.00	7.57	Market	1,911,287	
Toronto Western								492,097	1975

a The other pension plans did not provide information on investment returns.
b HOOPP did not provide market value returns.

Table 11.4
Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Education Sub-sector

Fund(a)	Percentage yield on fund						Book or market value	Investment income 1977	Years if not 1977
	1972	1973	1974	1975	1976	1977			
	(Per cent)							(Dollars)	
Teachers' Superannuation Fund	N/A	7.69	6.87	7.56	7.65	8.10	Book	166,240,000	
Queen's University	14.6	.1	-15.9	17.6	8.6	10.7	Market		
York University	10.44	-2.935	-3.813	10.559	5.542	7.298	Market	1,754,113	
Trent University								299,861	
Wilfrid Laurier			11.25	10.11	11.6	12.4	Market	143,236	
Laurentian University								300,081	
Nippissing Univ. Coll.	6.24	6.80	7.30	7.60	7.48	8.025	Book		
McMaster University Contributory Plan	11.38	1.09	-4.68	9.43	9.27	7.51	Market	2,372,123	July 1976-June 1977
McMaster University General Plan		4.73	6.27	7.28	7.60	6.83	Market	52,173	
University of Toronto		7.07	7.07	6.78	6.31	6.28	Book		
University of Waterloo	19.90	-4.94	-9.58	11.96	11.74	9.64	Market	2,000,000(E)	
University of Guelph	5.0	5.6	5.6	6.2	6.7	6.8	Book		
Brock University	13.16	1.42	-8.55	10.2	6.18	9.98	Market	407,802	
Ryerson Polytechnical Institute			8.1	8.5	9.0	9.2	Book	1,199,000	
Colleges of Applied Arts and Technology			8.5	8.8	9.2	9.5	Book	10,697,000	

E - Estimate.
a The other pension plans did not provide information on investment returns.

Table 11.5
Ontario Public Sector, Annualized Yield (1972-1977) and Investment Income (1977), Provincial Utilities Sub-sector

Fund	Percentage yield on fund						Book or market value	Investment income 1977	Years if not 1977
	1972	1973	1974	1975	1976	1977			
	(Per cent)							(Dollars)	
Ontario Hydro	5.5	6.0	6.5	6.2	6.2	7.6	Book	38,810,000	1976
Ontario Northland Transportation Commission	6.0	8.1	6.7	4.8	7.3	8.1	Book	3,317,565	

Study of Public Sector Pension Plans

Keith H. Cooper

January 3, 1979

CONTENTS

List of Tables 114

List of Charts 114

Introduction 115

Issues Involved in Funding Public Sector Pension Plans 116
- The Desirability of Pre-funding 116

Guidelines for Funding Public Sector Pension Plans 122
- Critique of Guidelines 122

Canadian Institute of Actuaries' Recommendations for Valuations of Pension Plans 128

Funding Considerations for the Indexation of Public Sector Pension Plans 128

Current Funding of Public Sector Pension Plans 135
- Why PSPP Costs Vary 135
- Critique of Most Recent PSPP Valuations 139
- General Assessment 144

Summary of Findings 144

Appendix A - Larger Public Sector Pension Plan Provisions, Work-force and Financial Characteristics, and Actuarial Methods and Assumptions 147

Appendix B - Guidelines for the Valuation of Pension Plans Relating to the Ontario Public Sector 153

Appendix C - Canadian Institute of Actuaries: Recommendations for Valuations of Pension Plans 161

Notes 174

LIST OF TABLES

Table 1 - Annual Retirement Benefit as a Percentage of Disposable (After-tax) Income in Final Year of Employment for City Employees 117
Table 2 - Investment Rates of Return for Various Forms of Securities After Deducting Consumer Price Index Increases 127
Table 3 - Comparison of Annuity Present Values for Varying Rates of Inflation and a Constant "Real" Rate of Return 131
Table 4 - Progress of Fund Components 133
Table 5 - Comparison of Fund Progress in Tenth and Later Years 134

LIST OF CHARTS

Chart 1 - Comparison of Individual Actuarial Funding Methods 124
Chart 2 - Index for Real Wages in Canada 125

INTRODUCTION

We have been requested by the Royal Commission on the Status of Pensions in Ontario to undertake a study of the six major Ontario Public Sector Pension Plans (PSPP) noted below:

- Public Service Superannuation Fund (PSSF)
- Teachers' Superannuation Fund (TSF)
- Ontario Municipal Employees Retirement System (OMERS)
- Hospitals of Ontario Pension Plan (HOOPP)
- Ontario Hydro Employees' Pension Plan (Hydro)
- Ontario Workmen's Compensation Board Superannuation Plan (WCB)

The terms of reference were as follows:

1. Advise the Commission whether the costs and the statement of actuarial and unfunded liabilities are the true costs and liabilities of each of the plans using data for the most current year or two years;

2. Advise the Commission whether the actuarial funding methods used are suitable for each of the plans in the circumstances;

3. Advise the Commission whether the actuarial funding methods of public sector employee pension plans should be different than those of private sector employee pension plans; and

4. Advise the Commission of any problems with regard to the above and advise of any areas requiring further information or clarification.

The terms of reference were verbally expanded to include the Adjustment Funds covering the funding of indexation payments for both Ontario Public Service employees and Ontario teachers.

This analysis was achieved by:

1. Examining the issues involved in funding public sector pension plans;

2. Reviewing existing guidelines for funding public sector pension plans;

3. Analyzing funding considerations associated with the indexing of public sector pension plans; and

4. Reviewing the current funding practices for the six public sector pension plans.

The findings of this study have been summarized in the final section of the report for easy reference.

ISSUES INVOLVED IN FUNDING PUBLIC SECTOR PENSION PLANS

The Desirability of Pre-funding

The funding of public sector pension plans (PSPPs) is a controversial subject. At one extreme, we find those who advocate pay-go funding in recognition of the fact that the government has an ongoing tax base from which to generate the necessary revenues to support the obligations of the pensions promised. Consequently, they question why huge reserves need to be established to cover these future promises when such assets could be put to better use today. Furthermore, they question why more valuable or "hard" dollars should be tied up today when future payments can be made with cheaper or "soft" dollars.

Those who advocate the funding of PSPPs, on the other hand, are concerned about the future ability of the government, regardless of its size, to meet pension obligations unless a disciplined approach to pre-funding has been undertaken. They see the desirability in charging current generations for their fair share of the cost of pension promises made to current members of the government. Good accounting practices are foremost in their minds as is the desirability of assuring the plan members of the security of their pension promises. Real assets also represent a base to fall back on should the government run into cash flow difficulties. The recent experience in New York City and the current Cleveland financial crisis are certainly evidence of the need for real assets versus using public debt.

In Ontario, there is no issue over whether to pre-fund PSPPs since the Ontario Pension Benefits Act requires pre-funding. What is at issue are a number of other factors tied to the funding process that need to be addressed. Each of these issues will now be discussed.

Benefit Levels

It is evident that overly generous benefit levels, in relation to what could be described income "adequacy," and other provisions such as generous early retirement features and unlimited indexing of pensions in payment, can lead to excessive costs to the employer. Good plan design is required to place adequate controls on pension costs.

In turn, it is imperative that if constraints on benefit levels and related plan provisions cannot be achieved, then the cost of such benefits must be calculated as realistically as possible by using up-to-date actuarial assumptions, and each unit within the government must incorporate such costs into its yearly budgets. Only in this way will

true recognition of such costs be reflected and become a charge to each year's taxes generated to support that unit. Once this is achieved, benefit levels will remain as is or will be adjusted depending on the taxpayers' willingness to accept the taxes being imposed. An analysis of the New York City pension situation suggests that the absence of this vital control mechanism led to the introduction of pension provisions that proved to be far more expensive than first realized (primarily due to the use of inadequate actuarial assumptions). Had each unit of government borne the true cost of its pension commitments, it is quite possible that the pension promises might never have been granted in the first place.

Table 1 compares the level of benefits available to members of New York City employees with those of other major U.S. cities and demonstrates how they have got out of line.

Table 1
Annual Retirement Benefit as a Percentage of Disposable (After-tax) Income in Final Year of Employment for City Employees

City	20 years' service	25 years' service
	(Per cent)	
New York	103	125
Chicago	37	47
Dallas	42	52
Denver	84	91
Detroit	94	104
Los Angeles	44	54
Memphis	44	54

Source Pensions and New York City's Fiscal Crisis, 1978.

In Ontario, the recent decision to charge the various school boards for the cost of pensions is consistent with the foregoing comments.

Inordinately large pay increases are automatically accompanied by large losses under a final pay pension formula. These losses have to be absorbed by the employer - in this case, the Province of Ontario. Until the decision was reached to require the local school boards to reflect such increased costs in their budgets, they had no possible way of recognizing the effect of permitting large pay increases to be granted to school teachers in their region.

Actuarial Assumptions

The use of actuarial assumptions that are not consistent with actual experience will generate gains if the assumptions are conservative, or losses if otherwise. In the case of New York City, the refusal by the plan trustees to utilize more up-to-date actuarial assumptions, as

determined from periodic experience studies, tended to undermine the financial soundness of the city's pension plans.

Any actuary who is doing a conscientious job should be utilizing actuarial assumptions that will assure the soundness of the plan. Only external factors which could not be anticipated should cause losses; for example, retirements occuring sooner than contemplated because of the introduction of machinery that makes certain jobs redundant.

In general, as long as experience studies are undertaken periodically to review such decrements as mortality, turnover, retirement and disability rates, and the results of these studies are reflected in the actuarial valuation assumptions, then there should not be any major concerns in this area.

Accounting of Costs

As commented on earlier, it is essential that the accounting of pension costs be made by each governmental unit in its budgeting process and that such costs be realistic (i.e. reflect the benefits promised and be based on realistic actuarial assumptions). To do otherwise is tantamount to a lack of control of where such costs are going in light of other related factors like wage increases, and, as well, does not provide proper recognition of the true cost implications to the present generation of taxpayers.

Investment of Funds

In Ontario, we find that the Teachers' Superannuation Fund (TSF) and the Ontario Municipal Employees Retirement System (OMERS) have funds invested in what is defined as "non-public debt" which is represented by non-marketable Ontario government debentures. Starting in 1975, OMERS began directing some of its cash flow toward the private sector and investing such funds in marketable securities. In 1979, OMERS will be free to invest 100 per cent of its cash flow in marketable securities. The Ontario Hydro Employees' Pension Plan (Hydro), the Hospitals of Ontario Pension Plan (HOOPP), and the Ontario Workmen's Compensation Board Superannuation Plan (WCB) all invest their funds externally in marketable securities.

The Ontario Public Service Superannuation Fund (PSSF), on the other hand, does not have any debt instruments issued to cover the assets of that plan. Instead, these funds become a part of the Consolidated Revenue Fund just as do the net deposits of the Province of Ontario Savings Office. Although there are no debt instruments for the PSSF assets, the government establishes a "Special Purpose Account" for keeping track of the inflows and outflows to the plan. Included in the inflows is the interest credited by the government to the so-called assets in the "Special Purpose Account."

Similar treatment to the PSSF is accorded to the "indexed" funds attached to the PSSF and TSF. These Special Purpose Accounts are referred to as the Public Service Superannuation Adjustment Fund (PSSAF) and the Teachers' Superannuation Adjustment Fund (TSAF).

On questioning individuals in the Treasury Division of the Ontario government, we were informed that Special Purpose Accounts are used instead of non-marketable debentures for a purely historical reason. The Ontario Legislature in 1920 decided that this was the way it was to be done. It should also be noted that the Ontario government guarantees the PSSF and TSF plans in its role as "employer." Before it can permit the assets of the TSF to be invested in marketable securities, the various school boards in Ontario would have to accept responsibility for the liabilities of the plan for the teachers in their jurisdiction as the municipalities have done in the case of OMERS.

There are several observations to be made about the procedures being used by the Ontario government for handling the assets of the PSSF, PSSAF, and TSAF.

1. By investing funds externally, the government should be able to generate a larger investment return than it would have to pay for similar funds borrowed in the marketplace. This applies equally to the TSF. The OMERS experiment corroborates this position.

2. By using "real" assets versus public debt, the government achieves at least the following two objectives:

   a) Plan members may experience a greater sense of security arising from the broader diversification of assets.

   b) Should any unit of government experience cash flow difficulties overall, and thereby not be able to meet its financial obligations, a part of which would be the required payments to pension plan beneficiaries (after utilizing current employee contributions in this regard), then in the instance where "real" assets exist, such assets could be used to meet current commitments. In the case where public debt is used, the assets belong to the government unit and the interest or the repayment of such debt can only come out of current government revenues which, if not available, leaves the pension plan beneficiaries in jeopardy.

3. If non-public debentures were issued, then this would have the effect of increasing the non-budgetary deficit and the government's net cash requirements in an amount equal to the net pension flow through the Special Purpose Accounts. There would not be any change in the budgetary deficit.

The other beneficial effect of using non-public debentures would be to make the government's outstanding debt more readily recognizable than it is today. Under the present arrangements, the total Ontario debt can only be determined by adding to its funded debt (i.e., public debt and non-public debt) the value of its unfunded debt which includes the PSSF, PSSAF, TSAF Special Purpose Accounts, the deposits from the Province of Ontario Savings Office, and certain advances payable.

4. By accepting the net flow of funds from the various government pension plans (PSSF, PSSAF, TSF, TSAF, and previously OMERS), the government reduces its external borrowing needs. However, with decreasing future capital expenditures, there appears to be less need for these funds. Recognizing the desirability of having tax revenues pay for general expenditures and having capital expenditures come out of debt, it is incumbent on the government that it does not fall into the trap of deploying capital derived from net pension fund flows toward general expenditures or toward nonproductive capital items. The government stated in its 1978 budget: "In an effort to en sure the successful implementation of this redeployment of public funds from the public to the private sector, the Government of Ontario initiated the OMERS experiment in 1975. This experiment has proven successful, and thought can now be given to instituting similar procedures for other sources of internal funds." This intention is certainly healthy. The 1978 Ontario budget also stated: "It [the investment of TSF funds privately] will not begin until after the report of the Ontario Royal Commission on Pensions has been received."

   The Ontario Government appears to be committed to deploying excess internally generated pension funds to marketable securities. This position is healthy and should be encouraged.

Funding Levels

Assuming that there is general recognition for the pre-funding of PSPPs, should there be any necessity for full funding using a projected benefit funding method such as entry age level premium or projected unit credit, the methods currently used for the six major Ontario PSPPs? A recent article in Financial Executive(1) suggests that a meaningful funding level for a pension plan would be to have assets at any point in time sufficient to cover its "accrued" benefits. This means sufficient assets at market value to provide all current employees and beneficiaries with the pensions they have accrued to that point in time. No future salary increases are assumed, benefits are based on service to that date, and discounts for future turnover are not applied.

Although funding of PSPPs is desirable, one can seriously question the desirability of one day having assets for the six major PSPPs that

are far in excess of their accrued liabilities. In fact, this is already the case for OMERS, HOOPP, Hydro, and the WCB with the two remaining plans within 15 per cent of being fully funded on an "accrued" liability basis. (See Item 7(c) of Section C of Appendix A for details).

It should be noted that the Ontario Pension Benefits Act prescribes a "Test Valuation" as a test for determining whether all or part of an actuarial deficiency must be amortized over a five-year rather than a 15-year period. This "Test Valuation" is very close to the "accrued liability" calculation. In fact, the "Test Valuation" could serve as a useful mechanism for developing a conservative approximation to the "accrued liability."

To prevent the PSPPs from becoming excessively funded, it is suggested that once the funded ratio under the "Test Valuation" reaches 100 per cent, the contribution required for the subsequent year not be permitted to exceed the amount necessary to maintain a 100 per cent funded status one year later, bearing in mind that pay increases must occur during the course of that year. The required contribution, therefore, would be the lesser of this revised amount, or the contribution otherwise developed following the requirements of the Ontario Pension Benefits Act.

An alternative to the use of the projected unit credit method prorated on service is the use of the same method, but prorating benefits using projected salaries. The resulting actuarial liability would be very close to the accrued liability in most instances, thereby making the ongoing valuation funding target (the actuarial liability) consistent with the goal of having assets approach the accrued liability. It may be desirable to move to this standard only when the point is reached at which the assets equate to 100 per cent of the accrued liability, otherwise it could take another 15 years to have the fund assets build to the accrued liability level.

There is probably no good reason why this standard, which has been suggested for public sector plans, could not be applied to private sector plans as well. Redundant funding is hardly desirable and, in effect, the present funding guidelines for Ontario using standard actuarial funding methods eventually lead to this unsatisfactory result. This is particularly true for government sponsored public sector pension plans where excess assets are not as necessary as in the private sector.

Cash Flow Considerations

It is evident that the PSSF and the two "adjustment" funds, the PSSAF and TSAF, could continue to form a part of the general assets of the province. This could be continued as long as the government was able to adequately forecast its future cash flow requirements, one part of which is its obligations under these three funds, and be satisfied that these commitments could be met. If there is any doubt

whatever, there is considerable value in deploying funds to the external marketplace, since such funds could be used to cover any potential cash flow shortage that might develop in the future.

Unfortunately, the prudence of today's government officials may not carry over to tomorrow's officials. What is understood and reflected on today may never be thought of or reviewed by others in the future. Recognition of this fundamental concern suggests that some portion of the assets of the funds, as well as the TSF, be deployed toward investment in external marketable securities.

GUIDELINES FOR FUNDING PUBLIC SECTOR PENSION PLANS

In November 1976, the Ontario Government issued a set of guidelines for the valuation of pension plans relating to the public sector. These are included herein as Appendix B. Apparently, at this time, these guidelines have been followed by the PSSF and TSF only. To the best of our knowledge, they have not been applied under the Hydro, HOOPP, and OMERS plans. They do not apply to other plans.

Critique of Guidelines

The following observations are made in respect to these guidelines.

Application of Guidelines

The guidelines apparently do not attempt to establish a basis for the triennial valuation required by the Ontario Pension Benefits Act. If the guidelines are designed meaningfully, they should be applicable to the triennial valuation.

Actuarial Method

The guidelines prescribed the use of any projected benefit funding method. In other words, the projection of salaries would be incorporated in final average plans (all five of the plans are now final average plans). Based on the comments made previously, it is questionable as to why the entry age funding method should be used other than to develop a relatively stable annual current service cost from year to year. This entry age method develops a larger actuarial liability than for the projected unit credit method, for example, and if overfunding is to be overcome, then there seems to be little justification to support the use of the entry age method other than to develop relatively stable current service costs.

One of the basic understandings under the PSSF and TSF is that employer current service contributions are to "match" employee contributions. This requirement undoubtedly goes back to the cost-sharing arrangement agreed to between the two parties for the cost of pensions.

However, this is far from reality as employer costs over the past 10 years for the PSSF and TSF have exceeded employee contributions, and substantially so under the TSF.

One unfortunate aspect of this "matching" requirement is that it can tend to force the actuary toward the adoption of a funding method and a set of actuarial assumptions that will develop a current service cost that closely approximates the employee contribution level. This hardly seems desirable, particularly since it virtually requires an actuary to adopt the entry age level premium method, which leads, over the long term, to full funding on a basis that is greater than if the projected unit credit method was employed. (See Chart 1 for graphical explanation of this phenomenon.)

Lastly, if the actuarial assumptions are to be realistic, it is imperative that the actuaries' inclination to use current and realistic assumptions not be inhibited by a constraint to equate employee and employer current service costs.

Decrement Assumptions

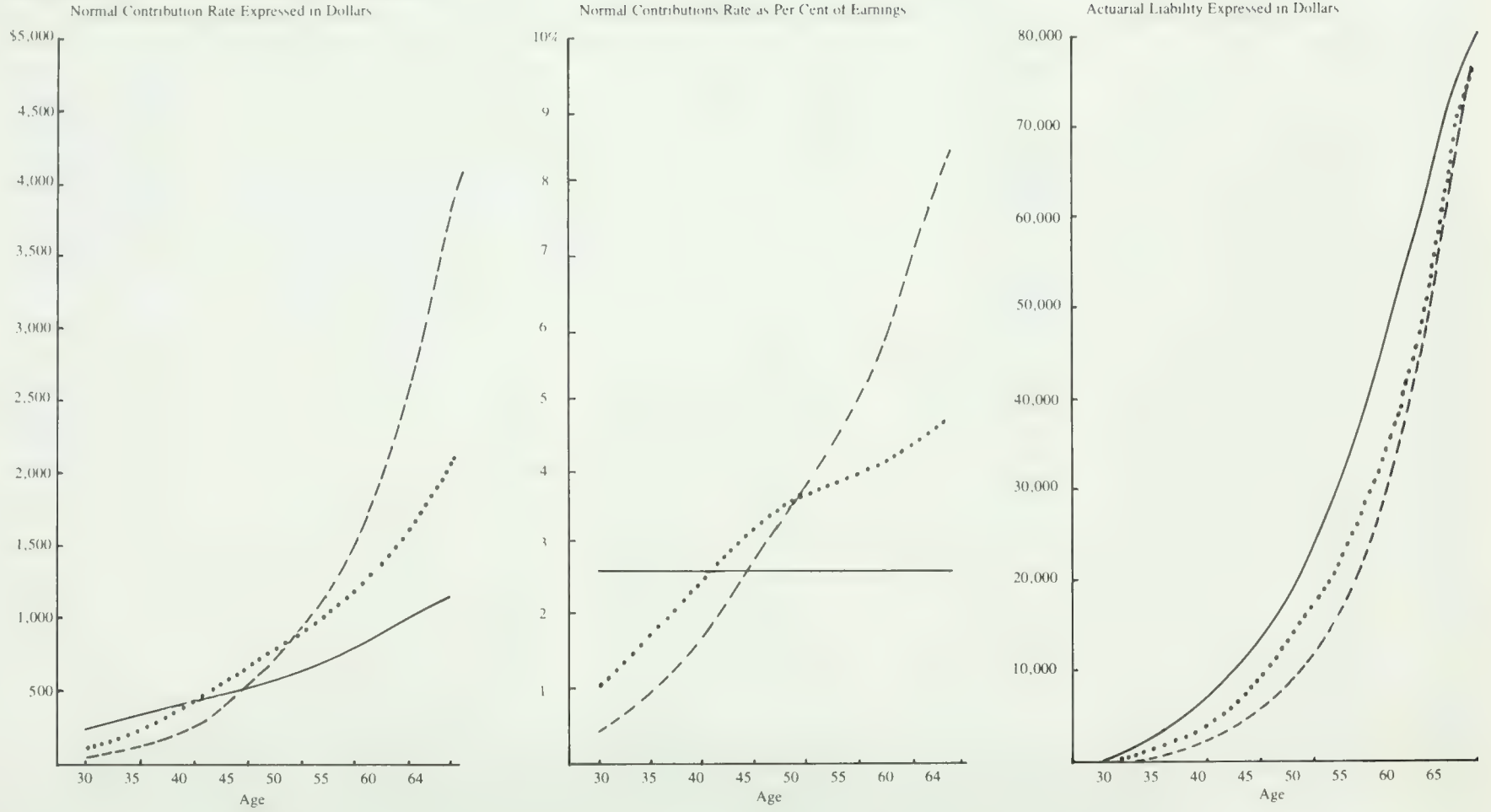
These assumptions, to the extent possible, should always be developed from recent experience studies conducted on the population data. The populations of these five plans are of sufficient size to justify the expense of undertaking such experience studies once every three years. Unless these studies are undertaken, there is no guarantee that the assumptions will be appropriate. In turn, there will be no assurance that the pace of funding will be adequate.

Economic Assumptions

The concept of establishing a realistic estimate of the actual rates of return on investments over the 10-year period following the valuation is desirable. However, when developing the rate for the years following this initial 10-year period, it is desirable that the actuary establish an investment rate of return that equals the rate of inflation plus the "real" rate of return anticipated to be earned, after expenses, on the various forms of assets to be held by the plan. This is vital if there is to be a natural correlation between the salary scale assumption (consisting of inflation, productivity, and merit/promotional increases) and the investment rate of return (consisting of inflation plus the "real" rate of return).

In Canada, over the past 50 years, the growth in "real" wages has followed a trend line of about 2.1 per cent per year (see Chart 2). This is very close to the average annual compound growth in productivity over this same period, namely, 2.25 per cent. Merit/promotional increases would be added to the productivity figure along with inflation to arrive at the total salary increase rate.

Chart 1
Comparison of Individual Actuarial Funding Methods



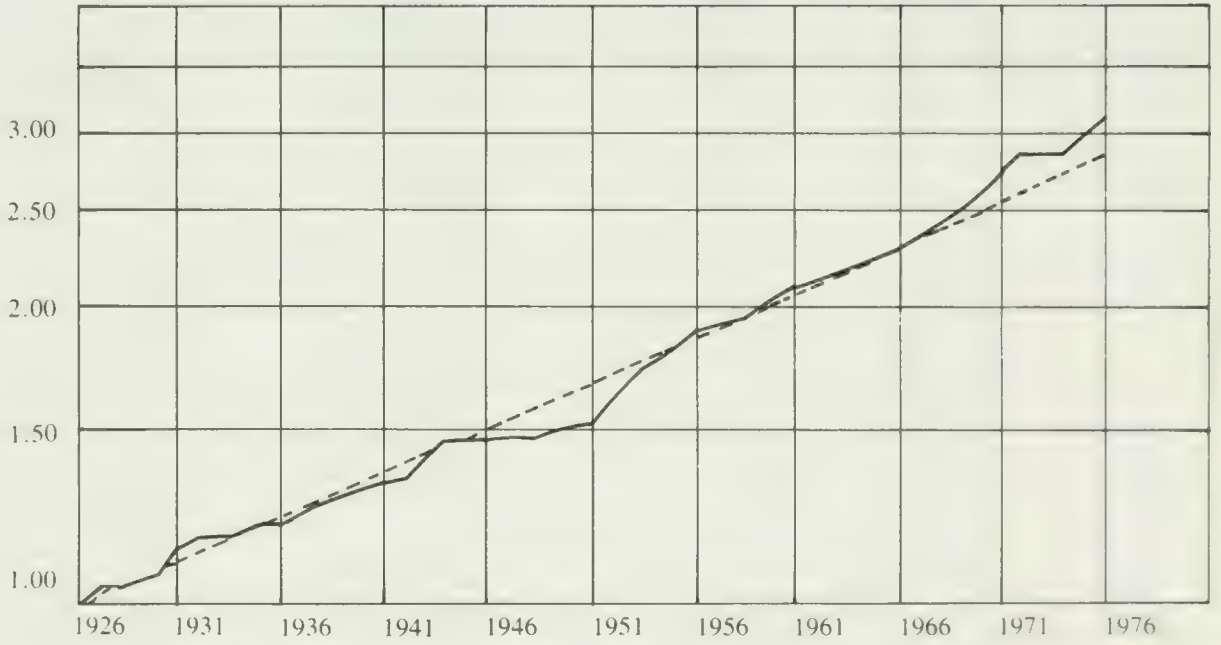
Assumptions

1. Male enters at age 30
2. Pension equal to 1 per cent of earnings in each year of service
3. Interest calculated at 5.5 per cent
4. Salary increases assumed 4.5 per cent
5. Salary at entry date $10,000
6. TPF&C 1971 Mortality Table assumed
7. Retirement Age 65
8. Benefit Payable for Life, guaranteed 5 years
9. Turnover—TPF&C Scales

Legend

----- Unit Credit Funding Method
..... Projected Unit Credit Funding Method
_____ Entry Age Level Funding Method

Chart 2
Index for Real Wages in Canada



——— Actual

----- 2.1 per cent Trend Line

Source: Average Weekly Wages and Salaries Industrial Composite Index published by Statistics Canada

Real growth in investment rates of return varies significantly by the type of investment. This is seen on examination of Table 2 following which portrays the "real" rates of return for various forms of investments on a gross basis and after deducting an expense charge and a risk factor to arrive at what is termed a "pure" rate of return. This analysis demonstrates that "pure" investment returns at the following levels can be expected for average performance under stable economic conditions.

Fixed income - short term	1.0 - 1.25 per cent
Fixed income - long term	1.4 - 2.4 per cent
Equities	3.0 per cent

Assuming no risk and .4 of 1 per cent higher return on Ontario long-term debentures over Canada's long-term, it would be reasonable to assume that long-term Ontario debentures would generate a "real" rate of return of about 2.45 per cent. Application of the risk factor would reduce this to approximately 1.60 per cent.

The actuaries performing valuations for the five major government plans should be assigning "real" investment rates of return to the assets of the plans involved in the neighbourhood of the "pure" investment rates noted above based on the long-range asset mix of the plan as determined by the fund managers.

Valuation of Assets

The method for valuing assets should be consistent with the basis for valuing the liabilities of the plan (i.e. with the economic assumptions) and should reflect long-term rather than short-term values. Discounting debt securities at the valuation interest rate to arrive at a capitalized value for such securities is an example of using a consistent basis for valuing assets.

Cash Flow Analysis

This analysis is particularly important, since it offers a meaningful portrayal of the direction of cash flows to the fund as well as cash flows to the province over the next 10 years. This latter point applies particularly to the PSSF, TSF, PSSAF, and TSAF funds but not to the other plans. It may be of value under OMERS since eventually there will be a repayment of existing non-public debentures that presently form part of the fund. If these are simply rolled over rather than reinvested in marketable securities, then there might be less need for such analysis other than to monitor contribution levels and the cash flow of the fund for investment purposes. In the case of HOOPP and Hydro, a cash flow analysis would also be useful for investment purposes as well as to provide management with an indication of the general direction in which contributions will be heading over the next 10 years.

Table 2
Investment Rates of Return for Various Forms of Securities After Deducting Consumer Price Index Increases(a)

Form of security	Gross investment return	Expenses(b)	Net investment return = (1)-(2)	Risk factor(c)	Pure investment return = (3)-(4)
			(Per cent)		
3-month treasury bills	1.000	.200	.800	.000	.800
30-day paper	1.750	.200	1.550	.375	1.175
90-day paper	2.000	.200	1.800	.500	1.300
Long-term Canada	2.250	.200	2.050	.625	1.425
MYW 40-bond index	3.250	.200	3.050	1.125	1.925
Mortgages	4.500	.600	3.900	1.550	2.350
Common stocks (TSE Industrial Value Index)	5.500	.200	5.300	2.250	3.050

a Developed from Towers, Perrin, Forster and Crosby, Canada Economic Tables, July 1977.
b Assumes a fund of at least $50 million.
c Half of excess return over the no-risk 3-month treasury bill.

CANADIAN INSTITUTE OF ACTUARIES' RECOMMENDATIONS FOR VALUATIONS OF PENSION PLANS

In general terms, these recommendations are to apply to public sector as well as to private sector pension plans. The most recent recommendations are included as Appendix C. The principle of establishing the "accrued liability" as a funding target is inherent in these guidelines as is the "real" wage and investment rate of return concept. (See Table 1 at the end of the recommendations in Appendix C.)

The concept of anticipating automatic cost-of-living adjustments to benefits in payment is also embodied in the CIA recommendations. Where benefits are adjusted after retirement to keep pace with the cost of living, it is clear upon examining Table 1 of Appendix C, that the "pure" or "real" interest rate, plus any performance premium or less any performance discount, becomes the effective rate of interest since the inflation component of the investment return is paid to the beneficiary in the form of increased pension payments.

FUNDING CONSIDERATIONS FOR THE INDEXATION OF PUBLIC SECTOR PENSION PLANS

The concept of establishing separate funds for the funding of post-retirement adjustments to pensions in payment appears to stem from the basic cost-sharing principle discussed earlier. Commencing January 1, 1976, employees and the employer under the PSSF and TSAF each contributed 1 per cent of earnings to the PSSAF and TSAF. The fund is used to pay the indexed portion of pensions to those who may at one time have contributed to the fund. For those who retired prior to 1976, indexed pensions are paid out of the Consolidated Revenue Fund.

Cash flow projections prepared by the Chief Actuary for the Ontario Government using two sets of inflationary assumptions, one grading from 7.2 per cent in 1977 down to 4 per cent in 1991 and later and the other assuming 8 per cent inflation throughout, developed the following results from the PSSAF and TSAF.

	Graded inflation		8 per cent inflation	
	PSSAF	TSAF	PSSAF	TSAF
Year cash flow first negative	1986	1987	1985	1987
Year of maximum fund	1989	1991	1986	1988
Year fund first negative	1996	1999	1992	1995

The caluations assumed a stable population throughout and were based on an assumed investment rate of return for new investments of 8 per cent for 15 years and 6 per cent thereafter. The salary scale and the graded inflation scale used are set out below.

Year	Salary scale	Graded inflation scale
	(Per cent)	
1977	6.00	7.20
1978	7.00	7.25
1979	8.00	7.00
1980	8.00	6.75
1981	7.00	6.50
1982	6.75	6.25
1983	6.50	6.00
1984	6.25	5.75
1985	6.00	5.50
1986	5.75	5.25
1987	5.50	5.00
1988	5.25	4.75
1989	5.00	4.50
1990	4.75	4.25
1991 and later	4.50	4.00

These projections provide a picture of what the possible prognosis for these funds will be. Obviously, the present 1 per cent contribution rate will have to increase. The problem is somewhat similar to that of the Canada Pension Plan where current beneficiaries are reaping a windfall at the expense of future generations of workers.

The report on the Federal Public Service Pension program requested by the Treasury Board indicated that the cost of pre-funding the indexing features of the Federal Public Service Pension Plan would require an annual contribution of 8.5 per cent, or 6.5 per cent more than is now being contributed, plus an additional amount to provide for the amortization of the past service portion by 1990 (18.3 per cent of 1976 payroll grading to 8.8 per cent of payroll in 1990). Discussions with the Chief Actuary for the Ontario Government indicate that a study now being completed for the Ontario Treasury Ministry suggests that the current service indexing costs will be about 7 per cent of earnings for the PSSAF and TSAF or about 5 per cent of earnings above the present contribution level.

There is little doubt that the contribution rate for indexing will have to be increased. The basic issues are when and by how much. The entire problem revolves around the desirability of separating the funding for indexing of benefits from the funding of basic plan benefits and the continuation of the cost sharing of pensions between employees and the employer.

If the indexing and the basic plan benefits were funded together, a realistic assessment of the long-range current service cost of the plan could be developed with this figure split roughly 50-50 between the employee and the employer. The additional past service cost could be

absorbed by the government. The major advantages of this approach would be as follows:

1. A more consistent measure of the true value of the total pension package so that the 50-50 cost sharing principle between employees and their public sector employer could be reinstated.

2. A more consistent basis for funding the combined benefits (basic and indexed) could be developed, while at the same time pre-funding rather than partially funding the indexed portion.

3. Combining the indexing feature with the basic plan valuation enables the actuary to employ the "real" rate of investment return as the interest assumption in the post-retirement area, thereby utilizing a consistent set of actuarial assumptions for both the basic plan and the indexing feature. On the assumption that the assumed "real" rate of return can be earned in times of either high or low inflation, the cost of indexing will not change as inflation changes.

4. The concept described earlier of building up assets under the plan to a level not exceeding the accrued liabilities of the plan can still be introduced. The only difference would be that the future indexation of benefits would be incorporated into the accrued benefits. The only potential long-range dilemma here is that the employer contribution prospectively could become less than the employee's contribution. However, it should be noted that this will occur in part due to the fact the employer has been, and will continue for some time, contributing more than what the employee is contributing.

5. By building the cost of indexing in with the basic plan, there is a more meaningful comparison of costs between public sector plans with cost shared 100 per cent indexing (PSSF and TSF) and those with ad hoc 50 per cent employer paid indexing (OMERS, Hydro, and WCB).

To aid in clarifying how a more consistent basis for funding could be achieved, three tables (Tables 3, 4, and 5) have been constructed to demonstrate that, regardless of the rate of inflation, the same degree of funding should continue for the combined "basic" and "indexed" benefits as long as it can be assumed that the "real" rate of return (gross rate of return on investments less inflation) remains relatively constant irrespective of the level of inflation.

Table 3 develops the single sum needed to provide an annuity of $100 annually in arrears over a 15-year period where a "real" rate of return of 3 per cent is applicable. This table shows that, in the instance where zero inflation exists, the cost of this 15-year annuity

is approximately $1,200. With zero inflation, there is no cost associated with indexing, and hence the cost of the "basic" portion of the annuity is $1,200.

If we assume inflation runs at a 5 per cent rate over the 15-year period, and the total investment rate of return is 8 per cent (3 per cent "real" plus 5 per cent "inflation"), the cost of the "basic" portion is reduced to $855 because of the use of a higher discount rate (8 per cent) versus the 3 per cent discount rate applied under the zero inflationary scenario. However, with 5 per cent inflation, there is now a cost for "indexation." This equals $345 and, when added to the $855 "basic" portion cost, gives rise to a total combined cost of $1,200.

On examining Table 3, it can be seen that although the costs of the "basic" and "indexed" portions vary depending upon the level of inflation assumed, their combined cost remains the same, i.e. $1,200. In effect, the combined cost can be derived by discounting the "basic" portion by the assumed real rate of return (3 per cent in our example) and ignoring the cost of indexing. Inherent in this approach is the assumption that all investment earnings in excess of the real rate of return will be applied to pay for the cost of indexing pensions.

Table 3
Comparison of Annuity Present Values for Varying Rates of Inflation and a Constant "Real" Rate of Return

Rates of return			Present value of $100 annual annuity over 15 years		
Inflation	Real	Total	Total rate (real)(a)	Indexed portion (inflation)(b)	Basic portion (total)(c)
(1)	(2)	(3)	(4)	(5)	(6)
	(Per cent)			(Dollars)	
0	3	3	1,200	-	1,200
3	3	6	1,200	230	970
5	3	8	1,200	345	855
7	3	10	1,200	440	760

Assumptions 1. A $100 annual annuity is assumed to be payable annually in arrears.
2. Total rate (based on real rate of return) is approximate since it actually varies slightly depending on the level of the rate of inflation.

a Provides for annual annuity of $100 annually increased by inflation rate. (This is calculated discounting $100 annual annuity payments at "real" rate shown in column (2).)

b Represents portion of assets required to pay for indexed portion of annuity, i.e., annual payments in excess of $100.

c Portion of fund required to fund flat $100 annuity assuming a rate of return equal to Total Rate, i.e., column (3) rate.

Table 4 demonstrates how this process would work when inflation is 3 per cent, the total rate is 6 per cent, and the real rate of return approximately 3 per cent (actually it would equal (1.06/1.03 - 1) or 2.9126 per cent in this example). It can be seen that the separate funds for "basic" and "indexed" benefits will work out to a balanced (zero) position if we set aside $971.23 in the "basic" portion and $230.15 in the "indexed" portion. Instead of using separate funds, we could have put the total amount ($1,201.38) in one fund, paid the combined "basic" and "indexed" portions from this fund and still have achieved a balanced (zero) position at the end of 15 years.

What would have happened if the inflation rate had changed at some point throughout the 15-year period? Would the respective "basic" and "indexed" portions have been in a balanced position at the end of 15 years under such a scenario? And what about the combined fund approach?

Table 5 depicts what would have happened if, starting with the tenth year, inflation had moved from 3 per cent to 5 per cent, and if the total fund rate had been assumed to increase from 6 per cent to 8 per cent. (This would obviously apply only in the instance where assets could be sold without asset depreciation occurring and with such assets being reinvested at the higher current prevailing rate.)

Under these assumptions, it can be seen, on examining Table 5, that the additional excess interest earned on the "basic" fund assets must be applied toward the cost of the increased indexed benefits (due to inflation moving from 3 per cent to 5 per cent). Otherwise there would be a surplus in the "basic" fund and an equivalent deficit in the "indexed" fund. By combining the two funds, we end up with essentially a balanced (zero) position at the end of 15 years.

Although in practice the scenario depicted would never work out exactly as demonstrated, the basic principle outlined for developing a realistic cost for combining the "basic" and "indexed" benefits is accurate. It is evident from the examples that there is no feasible way to accurately establish a "fair" value for the dollars to be allocated to the "basic" and "indexed" portions when established as individual funds since the amount required to be deposited in each varies significantly depending on the inflation assumption used, and more importantly, on the actual inflation ultimately experienced. However, by packaging the "basic" and "indexed" portions into one fund, it is possible to arrive at a relatively stable cost for the packaged benefits as long as a handle can be put on the "real" rate of investment return. Under public sector pensions where the investment rate is entirely a function of the gross rates of return on 20-year and longer bonds of that government, it is possible to arrive at a "real" rate of return that should stand up over a long period of time.

Table 4
Progress of Fund Components

Beginning of year	Fund			Interest			Annuity payments		
	Basic	Indexed	Total	Basic	Indexed	Total	Basic	Indexed	Total
		(Dollars)			(Dollars)			(Dollars)	
0	971.23	230.15	1,201.38	58.27	13.81	72.08	100	3.00	103.00
1	929.50	240.96	1,170.46	55.77	14.45	70.23	100	6.09	106.09
2	885.27	249.33	1,134.60	53.12	14.96	68.08	100	9.27	109.27
3	838.39	255.02	1,093.41	50.30	15.30	65.60	100	12.55	112.55
4	788.69	257.77	1,046.46	47.32	15.47	62.79	100	15.93	115.93
5	736.01	257.31	993.32	44.16	15.44	59.60	100	19.41	119.41
6	680.17	253.34	933.51	40.81	15.20	56.01	100	22.99	122.99
7	620.98	245.55	866.53	37.26	14.73	51.99	100	26.68	126.68
8	558.24	233.60	791.84	33.49	14.02	47.51	100	30.48	130.48
9	491.73	217.14	708.87	29.50	13.03	42.53	100	34.39	134.39
10	421.23	195.78	617.01	25.27	11.75	37.02	100	38.42	138.42
11	346.50	169.11	515.61	20.79	10.15	30.94	100	42.58	142.58
12	267.29	136.68	403.97	16.04	8.20	24.24	100	46.85	146.85
13	183.33	98.03	281.36	11.00	5.88	16.88	100	51.26	151.26
14	94.33	52.65	146.98	5.67	3.15	8.82	100	55.80	155.80
15	-	-	-	-	-	-	-	-	-

Assumptions
1. $100 annuity payable annually in arrears.
2. Inflation rate = 3 per cent.
3. Total rate = 6 per cent.
4. "Real" rate = 2.9126 per cent = (1.06/1.03 - 1).

Table 5
Comparison of Fund Progress in Tenth and Later Years

Beginning of year	Fund			Interest			Annuity payments		
	Basic	Indexed	Total	Basic	Indexed	Total	Basic	Indexed	Total
	(Dollars)			(Dollars)			(Dollars)		
A. Fund assumed to earn 6 per cent with inflation at 3 per cent									
10	421.23	195.78	617.01	25.27	11.75	37.02	100	38.42	138.42
11	346.50	169.11	515.61	20.79	10.15	30.94	100	42.58	142.58
12	267.29	136.68	403.97	16.04	8.20	24.24	100	46.85	146.85
13	183.33	98.03	281.36	11.00	5.88	16.88	100	51.26	151.26
14	94.33	52.65	146.98	5.67	3.15	8.82	100	55.80	155.80
15	-	-	-	-	-	-	-	-	-
B. Fund assumed to earn 8 per cent in tenth year and later with inflation moving to 5 per cent									
10	421.23	195.78	617.01	33.70	15.66	49.36	100	41.03	141.03
11	354.93	170.41	525.34	28.39	13.63	42.03	100	48.00	148.00
12	283.32	136.04	419.37	22.67	10.88	35.55	100	55.31	155.31
13	205.99	91.61	297.61	16.48	7.33	23.81	100	62.98	162.98
14	122.47	35.96	158.44	9.80	2.88	12.67	100	71.03	171.03
15	32.27	-32.19	.08	-	-	-	-	-	-
C. Excess of item B over item A									
10	-	-	-	8.43	3.91	12.34	-	2.61	2.61
11	8.43	1.30	9.73	7.60	3.48	11.09	-	5.42	5.42
12	16.03	- .64	15.39	6.63	2.68	9.31	-	8.46	8.46
13	22.06	- 6.58	15.48	5.48	1.45	6.93	-	11.72	11.72
14	28.14	-16.69	11.45	4.13	- .27	3.85	-	15.23	15.23
15	32.27	-32.19	.08	-	-	-	-	-	-

Assumptions 1. Same as for Table 4 during first 9 years.
2. In tenth and later years, it is assumed fund can be reinvested at an 8 per cent rate and that inflation moves to 5 per cent.

The Benefits Policy Branch of the Civil Service Commission of the Province of Ontario, in its submission to the Commission dated December 13, 1977, registered concerns about the variation in the costs derived for the PSPPs. They noted that the costs were developed by five different consultants using different actuarial assumptions and funding methods. The guidelines reviewed previously in this study were developed as a first step toward standardizing the costing of fringe benefits in the public sector. They were not conceived as being satisfactory for the purpose of making comparisons with the private sector.

In this section of the report we will demonstrate that there are a number of reasons why the costs of PSPPs under review should be different even with the benefit of the guidelines established in November 1976. We will examine in this section the reasons for the differences, including the choice of funding method, and critique the most recent PSPP valuations.

Why PSPP Costs Vary

The following summarizes the reasons for the different cost levels between the PSPPs:

Benefit Provisions

Included under this heading are such items as:

- Employee contributions;
- Type of plan (final pay, career average, flat dollar, money-purchase);
- Eligibility for unreduced pensions;
- Averaging period for final earnings and YMPE;
- Normal form of pension;
- Availability of indexing and the extent to which full indexing is provided and the degree to which indexing is being funded;
- Vesting formula;
- Early retirement subsidies and supplements;
- Maximum service accruals;
- Maximum pension limitations;

- Availability of ancillary benefits such as death and disability benefits.

The major provisions of the PSPPs are contained in Appendix A, Section A. The critical differences can be summarized as follows:

- The degree to which unreduced pensions are made available;

- Prior service, in part, based on career average instead of final average formula (OMERS and HOOPP);

- Period for averaging final pay (5 or 7 years) and the YMPE (1,3, or 5 years);

- Integration formula offset (either .7 per cent or .625 per cent, depending on the plan);

- Automatic indexing at 100 per cent level (maximum annual 8 per cent adjustment) versus ad hoc adjustments at about one-half of this level;

- Vesting which varies from immediate to 10 years.

Work-force Characteristics

An examination of Section B of Appendix A outlines the essential characteristics of the work-force of each of the PSPPs. There are significant differences in the sex mix between the various work-forces with close parallels occurring between the PSSF and OMERS, and the TSF and WCB. Hydro and HOOPP are at opposite ends of the scale. The average age, average service, and average entry age also vary somewhat with the ranges being as follows:

	Range
Average age	34-41
Average service (years)	7-9
Average age at hire	25-34

The key variant under an entry age level premium valuation, other than the actuarial assumptions themselves, is the entry age, whereas under the projected unit credit method, the average age is the critical factor. It is evident from the comparison of the average ages at hire that current service costs have to vary from group to group, even when all other factors such as plan provisions, sex mix, and salary levels are identical.

Salary levels also have a bearing on cost levels, and as can be seen from Appendix A, there are some variations in pay levels from group to group, although some of this is due to different valuation dates (see line 1, Section D of Appendix A for valuation dates.)

Lastly, the degree to which benefits have previously been funded for those in receipt of benefits also has a bearing on the cost level of the plan. The extent to which indexing costs have not been funded heretofore has an obvious impact on current amortization payment levels. The PSSF and Hydro have the highest beneficiary/worker ratio at 20 per cent, while the TSF and OMERS are the lowest at 11 per cent. HOOPP and WCB are at the 15-16 per cent level.

Actuarial Method

The entry age and projected unit credit methods are the ones used for the funding of the PSPPs. In the past, OMERS used the unprojected unit credit method for the career average plan. We understand that they are now using the projected unit credit method for the final average plan, but with a minimum total contribution equal to the plan's defined employee and employer contributions.

It is unlikely that there would be any significant change in current service cost for all PSPPs, except for the TSF, if the entry age or the projected unit credit methods are utilized. Because of the low average age (34 years) for the TSF, the current service cost would decrease from present levels. However, due to the cutback in the growth of the teaching profession, it is highly likely that the average age will increase significantly over the next few years. In the interest of maintaining relatively stable costs, the entry age funding method should probably remain in place.

On the other hand, the actuarial liability for the entry age method will always be greater than for the projected unit credit method with commensurately higher amortization payments. Consequently, total costs under the entry age method for the various PSPPs must be greater than for the projected unit credit method, notwithstanding their current age/service/sex characteristics.

It should also be noted, as explained in the Financial Executive article referred to earlier, that the level of unfunded actuarial liability has no meaningful significance to the funded status of a pension plan. It is the relationship of the assets to the accrued liability that is critical. Although the ongoing valuation unfunded actuarial liability of the TSF appears enormous, the funded status based on its wind-up or accrued liability is about the same as for the PSSF (86 per cent for the TSF versus 85 per cent for the PSSF). The WCB plan, on the other hand, is excessively funded (134 per cent) when assets are compared with its accrued liability. One has to question the desirability of pumping more employer contributions into this plan.

Actuarial Assumptions

The actuarial assumptions adopted for valuation purposes must vary from employee group to employee group in order to reflect as closely as

possible the experience expected to emerge. Otherwise, the cost levels developed will prove to be either overly adequate or inadequate. If the former, surplus funds will be generated, while if the latter, the plan eventually will require additional funds to overcome the deficiencies that are bound to develop.

Detailed experience analyses have been undertaken for the recent valuations of the PSSF and the TSSF. The turnover and retirement rates experienced for each of these plans are quite different, with expected lower turnover in the teacher ranks, but significantly higher utilization of early retirement. Both of these factors lead to higher costs under the TSF as compared to the PSSF.

Even with the use of realistic assumptions for salary increases over the long term, there are bound to be aberrations over the short term that will lead to salary losses. These have been accentuated in recent years under the TSF and HOOPP as the result of "catch-up" salary adjustments which have had the effect of increasing the actuarial liabilities of these plans immeasurably.

Other actuarial assumptions also vary from employee group to employee group - for example, disability and mortality rates - although for employee groups as large as these there should be no major differences over an extended period of years.

Investment Performances

Variations in actual investment performance from anticipated results can have a significant impact on costs. The basis upon which the PSPPs are established places the onus for absorbing gains or losses in the hands of the employer. Assuming the continuation of the use of government debentures, or the equivalent investment rate of return on such debentures in the case of the PSSF, there should be a good chance of defining fairly precisely the "real" rate of return for the PSSF and TSF. The rates of return on the remaining PSPP funds should be higher over the longer term, reflecting the greater rates of return available on other forms of securities. However, this may not prove out over the short term, and possibly even the longer term. Poor investment performance results could occur, thereby resulting in higher overall employer pension costs than would have been the case if the assets had been invested 100 per cent in government debentures.

In summary, there are a number of reasons why the costs of pensions for the six public sector pension plans should vary. Even if identical pension provisions existed, consistent investment performance occurred, and the same funding method was used, there would still be differences in cost levels as the result of different work-force characteristics and the fact that actuarial assumptions for turnover and retirement utilization, to name only two, will probably vary from employee group to employee group.

The only satisfactory way of comparing the cost of both public and private sector pension plan benefits is to adopt the approach outlined on page 18 of the Civil Service Commission's submission to the Commission in which reference is made to a 1974 State of California approach to this problem. Their approach attempts to establish the cost of employer benefits by assuming that the employer interested in comparing his benefit programs with other competitor organizations adopts the benefit plans of the comparison organizations. These benefits are then priced using the age, sex, salary, and other demographic characteristics of that employer's work-force. As well, a consistent set of actuarial assumptions and funding techniques are used to develop the costs of the benefits. This is a highly sophisticated and expensive technique for comparing benefit costs.

Critique of Most Recent PSPP Valuations

The following comments are offered regarding the valuations of the various PSPP plans. These comments are offered in response to the overall terms of reference for this study which requested us to determine whether the actuarial costs and liabilities of the plan were "true" and the funding methods suitable. In this connection it should be recognized that the actuaries have far greater insight into the past experience of each plan than we could possibly acquire at a distance. This, therefore, places them in a much better position to make better judgments as to the assumptions that together will best measure the future outcome of events under each plan.

PSSF Valuation - December 31, 1976

This valuation was developed using actuarial assumptions based on current experience. The interest rate used was also developed conservatively, having been set at 7.25 per cent (the fund was currently earning 7.56 per cent).

Recognizing the points made previously in this study on real growth in wages, there is probably some need to review the adequacy of the real growth in wages used in the PSSF valuation where it appears that merit/promotional increases were introduced but very little, if anything, was included in the salary scale assumption for productivity. We noted earlier that real wages, exclusive of merit and promotion, have been on a 2.1 per cent annual trend line over the past 50 years.

We also discovered that provincial long-term bonds have generated a 2.45 per cent real rate of return with a 1.60 per cent net rate after a risk factor is applied. The PSSF valuation used a 1.75 per cent real rate (see Section D of Appendix B) which is conservative by about .7 per cent of 1 per cent, recognizing there is no risk involved. This conservatism will offset part of the shortfall in productivity that may not have been reflected adequately in the salary scale. Combining this .7 of 1 per cent with the .3 of 1 per cent conservatism in the interest

rate yields a gain of 1 per cent which is about 1.1 per cent short of the 2.1 per cent trend in growth in real wages (productivity).

Notwithstanding this concern, and although the costs developed may be somewhat understated, the critical concern should be that the accrued liabilities are covered by the assets of the plan. Currently the funded status is 86 per cent. Earlier comments about developing a funding basis that will generate a current service cost that matches the level of employee contributions may have been a contributing factor in the decision to adopt the particular economic assumptions used. In fact, the employer current service cost developed was 6.06 per cent as compared with the 6 per cent employee contribution rate. To have utilized a higher salary scale assumption would have increased the employer cost significantly.

To summarize, the valuation cost basis is probably slightly understated for the reasons mentioned. A move to the projected unit credit funding method using realistic assumptions, however, would probably generate a total employer cost close to that developed in the December 31, 1976 PSSF valuation. Consequently, there is little reason to question the reliability of the numbers developed. What should be explored is the desirability of continuing the practice of developing an employer current service contribution that matches the employees' current service contribution. Also, the inclusion of the funding of indexed pensions with the basic plan benefits should be considered in the future.

TSF Valuation - December 31, 1975

The comments on this valuation are very similar to the ones made for the PSSF. Real investment rates of return used were 3 per cent versus an expected norm of 2.45 per cent, a potential of .55 of 1 per cent overstatement in real rates of return. Real wages have been established at 1.5 per cent which is below the 2.1 per cent productivity trend line. There appears to be nothing included for merit/promotional increases which may not be too significant for teachers. The current investment yield is 7.5 per cent versus the 7 per cent interest rate, which provides a current cushion of .5 of 1 per cent. Overall, there appears to be a shortfall of almost 1 per cent, approximately the same as for the PSSF valuation. It is interesting to note that the TSF matching contribution rate is 6.4 per cent versus 6.06 per cent for the PSSF. Adjusting for the shortfall mentioned above would increase this 6.4 per cent contribution rate considerably.

A move to the projected unit credit method would help substantially due to the very young average age of the teacher group. Because of this, it can be assumed the overall funding of the TSF is adequate. Again, the cost-sharing principle appears to loom as a contributing factor in the actuarial assumption decision-making process.

OMERS - January 1, 1977

This valuation which we reviewed was based on the career average plan. It is conservatively done. With unprojected unit credit funding and a 6 per cent interest rate (versus a fund earning 8.9 per cent), there is little doubt about this even if the actuarial assumptions may not have been developed conservatively. The move to the investment of assets in marketable securities also enhances the opportunity for increasing the real rate of return on investments to a level closer to 3 per cent.

Discussions with the actuary for the OMERS plan produced the following information regarding the valuation, as of January 1, 1978, of the new final average plan.

Funding method	Unfunded actuarial liability	Total normal cost
	(Millions of dollars)	(Per cent)
Projected unit credit	115	9.92
Level cost method	197	12.20

The level cost method determines the actuarial liability by deducting from the present value of future benefits the present value of combined matching employee and employer contributions amounting to 12.2 per cent of payroll. The cost of amortizing $115 million over 15 years is at most .8 of 1 per cent of the approximate $1.5 billion payroll and when added to the projected unit credit cost of 9.92 per cent yields a total contribution of about 10.7 per cent of payroll. As this is less than the matching contribution of 12.2 per cent, OMERS will probably contribute the 12.2 per cent amount and nothing more.

The actuarial assumptions adopted for these projections were as follows:

	Per cent
Investment rate of return	6
Inflation	3
Salary increase rate	5
Productivity	1
Merit/promotion	1
Real rate of investment return	3

Recognizing the manner in which investments have been made and the exceptional performance achieved to date, the 3 per cent real rate is probably justified. However, the use of a 1 per cent productivity rate is low when compared with the 2.1 per cent trend line rate. Recognizing there is a cushion inherent in the 12.2 per cent contribution rate over the 10.7 per cent projected unit credit contribution rate of 1.5 per cent, it is fairly evident that the OMERS plan is being funded adequately. This is borne out further when it is recognized that the

plan is overfunded when the assets are compared against the accrued liability.

Over the longer term, however, it is also evident that funding the plan using the matching employee/employer contributions will lead to a funded position where the assets will always be greater than the accrued liability, a posture that we believe to be excessive, particularly for a government-sponsored pension plan.

HOOPP - December 31, 1976

This valuation appears to have been developed with actuarial assumptions that have not been based on any recent experience studies, with the exception of an analysis of turnover experience which indicates that the rates used are 75 per cent of the actual termination rates over the first seven years of operation of the plan.

The 5-1/2 per cent valuation interest rate is conservative as is the use of a 4 per cent level annual increase in the YMPE (versus 12-1/2 per cent through 1983 or 1984). If we assume that the 4 per cent increase rate in the YMPE reflects inflation and productivity, then the salary scale of 4-1/2 per cent includes 1/2 of 1 per cent for promotion and merit increases. If we also assume productivity of 2 per cent is included in the 4 per cent YMPE increase rate, then inflation has been set at 2 per cent. This then implies a 3-1/2 per cent real rate of investment return. This may be somewhat ambitious for the fund to earn but is certainly not unattainable.

Although there is not sufficient information provided to give a satisfactory overall assessment of the realism of the cost figures developed, it can be stated that overall the cost figures would appear to be conservative, particularly when ad hoc pensioner increases have never been granted and the inflation component in the interest rates earned on pensioner assets above the assumed 2 per cent rate will generate gains to the plan. An area where conservatism could be lacking is in the use of an average retirement age of 64. Experience could show that this is too high an age. Overall, however, the plan is well funded since, according to the plan's actuary, the assets exceed the accrued liability.

Hydro - December 31, 1976

An analysis of experience against the assumptions made since the last valuation (December 31, 1973) was included in this report. This is referred to as a gain and loss analysis which is an excellent tool for monitoring the actual experience of the plan against the various assumptions made. Changes were made in pertinent assumptions to adjust for changes in the plan as well as experience trends.

The only area of concern, once again, rests with the use of meaningful real growth in wages and real rates of investment return. The valuation assumed a 6 per cent interest rate (as compared to a most recent yield of 6.4 per cent) and a salary scale of 5-1/2 per cent. The differential between these two factors is 1/2 of 1 per cent and is the smallest of all the six plans under examination as shown below:

Plan	Excess of valuation interest rate over salary scale assumption
	(Per cent)
PSSF- males	.75
- females	1.15
TSF	1.5
HOOPP	1.0
Hydro	.5
WCB	1.5

Unfortunately, the increase in the YMPE has also been set at 5-1/2 per cent, the same as the salary scale rate. This is partially conservative because it ignores the 12-1/2 per cent increase in the YMPE through 1983 or 1984, but is probably too high for years thereafter since it should exclude the merit/promotional scale applicable at Hydro. Although this information and the inflation rate are unknown, the key favourable factor is the narrow gap between the interest rate and the salary scale. This plan, like HOOPP, is funded using the projected unit credit method which is not as conservative as the entry age method. Consequently, it is more important that the assumptions be as realistic as possible. On balance, there probably could be more conservatism in this valuation, although the resulting numbers are undoubtedly sufficient to meet the plan's promises. It would also appear, although the information was not available, that the assets would probably come close to the plan's accrued liability.

WCB - December 31, 1977

This valuation has been completed using economic assumptions identical to the TSF, as well as using the entry age funding method. Consequently, the comments are equally applicable to those for the TSF except that the real rate of return opportunity for this plan should exceed that for the TSF. Consequently, the 3 per cent expected real rate of return is probably a realistic goal. The fund earned 7.32 per cent in 1977 as compared with the assumed rate of 7 per cent.

Termination rates used were developed from an analysis of 1977 experience. No other experience studies were undertaken with prior year assumptions continuing to be used, except for the retirement assumption which was made more conservative by assuming 50 per cent of eligibles for the 60/20 and the age plus service = 90 formulae would retire at that point and the balance at age 65.

This valuation generated a surplus of $18,740,000 on an accrued liability basis and $13,024,000 on an ongoing valuation basis. The plan is definitely well funded and the current service contributions would probably be found to be conservative when compared with costs developed using the projected unit credit funding method and realistic actuarial assumptions.

General Assessment

Generally the PSPPs are being funded adequately. It should be recognized, however, that there are differences in the degree of funding ranging from those that are more conservatively funded due to the use of the entry age versus the projected unit credit method, those that have developed realistic economic assumptions encompassing real growth in wages and merit/promotion scales as well as reasonable real rates of investment return in relation to the types of assets being used, versus those where less realism has been reflected, and demographic assumptions that are in line with recent experience versus being best judgment factors.

SUMMARY OF FINDINGS

The findings of this study are as follows:

1. The six public sector pension plans are being funded relatively adequately, although there is a definite need to:

   - base decrement rates more closely to the results of current experience studies;

   - base economic assumptions on realistic assessments of real growth in wages, inflation, and merit/promotional scales, and real investment rates of return applicable to the types of securities in which the fund assets are invested;

   - wrap the funding of indexed benefits in with basic plan benefits, and reflect the funding of such benefits by using the real rate of return in the post-retirement area;

   - target the funding of the plans toward accrued liabilities, including the indexing of such benefits, (using the Ontario Pension Benefits Act Test Valuation basis as the standard) rather than toward ongoing liabilities;

   - move away from the concept of having the employer current service cost match as closely as possible employee contributions. Otherwise, the funding of public sector pension plans eventually will generate assets exceeding accrued liabilities.

- move the plans toward the use of a consistent funding method; namely the projected unit credit funding method prorated on service although consideration of the use of this method of prorating benefits on projected earnings might be more consistent with the concept of having public sector pension plans target their funding to accrued liabilities, including the cost of indexing accrued benefits. The use of the projected unit credit method prorated on earnings should probably only be used when the plan's assets equal the accrued liability.

2. Move the public sector plans toward the desirable goal of investing in real assets (marketable securities) versus public debt in order to:

   - ameliorate cash flow difficulties that could possibly emerge in the future;

   - provide a greater sense of security of benefits in the minds of the workers and beneficiaries of such plans;

   - lessen the possibility of internally generated funds being deployed toward nonproductive items or applied to cover general expenditures which should be more properly paid for out of current tax revenues;

   - have the potential for generating a higher level of investment return than might otherwise be the case where the fund is invested 100 per cent in government debt.

3. As a minimum, have the assets of the PSSF, PSSAF, and TSAF that are now earmarked for the Consolidated Revenue Fund handled in a similar manner to the assets of the TSF, i.e., invested in non-public government debentures. In this way, the total debt of the province could be established more easily than at present (the PSSF, PSSAF, TSAF, and the Province of Ontario Savings Office assets are currently classified as unfunded debt).

4. Establish the principle of undertaking periodic forecasts of cash flows to the various pension plans. For the PSSF and TSF (and possibly OMERS) also develop the cash flow of funds available to the province for investment purposes. This is a sound approach to the management of pension plan investment flows that provides as well an indication of the internal funds available for the government to invest.

5. Require that internal cost controls for pensions be established by requiring that the cost of pensions be incorporated in the budgets of governmental units, e.g., local school boards. This

is the only way that the recognition of the cost of pensions will be understood. The cost of indexation should also be included in local budgets.

6. Encourage the various public sector organizations to examine their pension programs to satisfy themselves that the benefit levels provided are not excessively beyond what could be called "adequacy" levels when measured in after-tax terms. Also encourage those plans now providing fully indexed pensions for retirements occurring prior to age 65 to provide less than full indexing in order to help discourage the excessive utilization of the earlier retirement provisions of the plans. Indexing at, say, a 50 per cent level might be beneficial in achieving this desired result.

7. Encourage the public sector to work with consulting organizations that have developed refined techniques for comparing the cost of pension programs in a meaningful manner so that direct comparisons can be made for the "real" employer costs of public and private sector pension and benefit programs. In this way, more direct comparisons can be made as to the "real" cost of total compensation programs to public and private sector employers.

Appendix A
Larger Public Sector Pension Plan Provisions, Work-force and Financial Characteristics, and Actuarial Methods and Assumptions

	PSSF	TSF	OMERS	HOOPP	HYDRO	WCB
A. Major Plan Provisions						
1. Employee contributions						
a) Basic plan	4.4% / 6%	4.4% / 6%	Retirement at: 65 5.5%/7% 60 6.5%/8% 55/30 6.5%/8% 50/30 7.5%/9%	4.5% / 6%	3.4375% / 5%	3.9% / 6% (Grades by age at entry for those who joined plan prior to 10/26/72)
b) Indexing	1%	1%	None	None	None	None
2. Eligibility for unreduced pensions	65/10 60/20 Age + service = 90	65/10 Age + service = 90	65 (Exceptions: supplementary plans with higher contributions	65 62/20	65 60/25 (Age 60 for females hired prior to 1/1/76)	65/10 60/20 Age + service = 90
3. Unit of pension						
a) Benefit accrual	2% x service	2% x service	2% x service	2% x service from 1/1/60 (career average plan prior to 1/1/60)	2% x service	2% x service
b) Earnings base for benefit accrual	Highest consecutive 5-year average	Highest consecutive 7-year average	Highest consecutive 5-year average	Highest consecutive 5-year average	Highest consecutive 5-year average	Highest 5 of last 10 years (highest 3-years for service prior to 1/1/66)

Appendix A
Larger Public Sector Pension Plan Provisions, Work-force and Financial Characteristics, and Actuarial Methods and Assumptions (continued)

	PSSF	TSF	OMERS	HOOPP	HYDRO	WCB
c) Integration with CPP (offset applies from age 65 only)	.7% x service from 1/1/66	.7% x service from 1/1/66	.7% x service from 1/1/66	.625% x service from 1/1/66	.625% x service from 1/1/66	.7% x service from 1/1/66
d) YMPE average used for integration offset	3 years	1 year	3 years	5 years	5 years	5 years
e) Maximum pension	70% less CPP offset	70% less CPP offset	70% less CPP offset	70% less CPP offset	70% less CPP offset	70% less CPP offset
f) Normal form of pension	50% continuation to survivors	50% continuation to survivors	50% continuation to spouse or eligible children, plus additional 10% for each eligible child	50% continuation to survivors	50% continuation to survivors	50% continuation to survivors
4. Vesting for retirement benefits	10 years	10 years	Immediate	10 years	1 year	10 years
5. Post-retirement adjustments						
a) Formula	1971-75 - ad hoc employer paid 1976 - automatic based on CPI with 8% annual ceiling (shared cost)	Same as for PSSF	Ad hoc adjustments/ employer-paid	None	1971-75 - ad hoc as for PSSF 1976 - as for PSSF but at half rate basis recognizing no employee contributions	Regular ad hoc adjustments/ employer-paid but at approximate half-rate basis

Appendix A
Larger Public Sector Pension Plan Provisions, Work-force and Financial Characteristics, and Actuarial Methods and Assumptions (continued)

	PSSF	TSF	OMERS	HOOPP	HYDRO	WCB
b) Percentage adjustments 1971-1978	46%	46%	38%	Nil	28%	20%
B. Work-force Characteristics						
1. Sex composition						
a) Male	63%	40%	68%	21%	86%	45%
b) Female	37%	60%	32%	79%	14%	55%
2. Average salary	$14,583	$15,060		$13,141	$18,825	$15,625
3. Average age	40	34	41	41	39	38
4. Average service(years)	8	9		7		8
5. Average entry age = (3) - (4)	32	25		34		30
6. Anticipated future annual growth in work-force	1%		4%	6%		?%
7. Percentage of beneficiaries to contributors	20%	11%	11%	15%	20%	16%

Appendix A
Larger Public Sector Pension Plan Provisions, Work-force and Financial Characteristics, and Actuarial Methods and Assumptions (continued)

	PSSF	TSF	OMERS	HOOPP	HYDRO	WCB
C. Financial Characteristics						
1. Range of total contributions 1965 to 1976 (exclusive of 1% indexing costs) as % of covered payroll	10.5%-13.2%	14.2%-25.2%	8.8% - 11.5%	9.8% - 14.1%	16.4% - 18.8% (ignores 10.0% rate in 1965)	
2. Most recent employer contribution as % of covered payroll	8.1%	12.7%	4.7%	7.2%	15.8%	113% of employee contributions
3. Benefits and refunds as a % of total contributions	44%	70%	13%	19%	25%	
4. Annual net cash flow to fund (1975 levels) in thousands	$137,924	$243,463	$165,666	$69,730	$78,535	
5. Annual net cash flow to province = net cash flow to fund less interest costs owing to fund on provincial investments and employer contributions to fund (thousands)						
a) 1975	$7,638	$-24,481	$28,924	--	--	--
b) 1974	4,445	-34,371	35,081	--	--	--

Appendix A
Larger Public Sector Pension Plan Provisions, Work-force and Financial Characteristics, and Actuarial Methods and Assumptions (continued)

	PSSF	TSF	OMERS	HOOPP	HYDRO	WCB
c) 1973	144	44,352	38,010	--	--	--
6. Fund yield (year)	7.6% (76/77)	7.5% (1976)	8.9% (1976)	5.9% (1976)	6.4% (1976)	7.3% (1977)
7. Unfunded actuarial liability (surplus) @ most recent valuation date ($ thousands)						
a) On-going basis	$505,355	$1,397,178	$(110,632)	$122,133	$142,530	($13,024)
b) Wind-up basis(a)	214,426	375,190	N/A	N/A	N/A	(18,740)
c) Funded ratio on basis of wind-up(a) calculations	86%	85%	more than 100%	more than 100%	Probably about 100%	134%
D. Actuarial Method and Assumptions						
1. Valuation date	Dec. 31,1976	Dec. 31,1976	Jan. 1, 1977	Dec. 31, 1976	Dec. 31, 1976	Dec. 31, 1977
2. Actuarial funding method	Entry age	Entry age	Unprojected unit credit (career average plan)	Projected unit credit	Projected unit credit	Entry age
3. Interest rate	7.25%	7.00%	6.00%	5.50%	6.00%	7.00%
4. Inflation rate	5.50%	4.00%	N/A	Not stated	Not stated	4.00%

Appendix A
Larger Public Sector Pension Plan Provisions, Work-force and Financial Characteristics, and Actuarial Methods and Assumptions (concluded)

	PSSF	TSF	OMERS	HOOPP	HYDRO	WCB
5. Salary scale (includes inflation, merit, promotion and productivity)	6.5% males 6.1% females (assumes 30 years' service	5.5%	N/A	4.5%	5.5%	5.5%
6. Real growth rates						
a) Interest = D(3) - D(4)	1.75%	3%	N/A			3%
b) Wages = D(5) - D(4)	1% males .6% females	1.5%	N/A			1.5%
7. Growth in YMPE	12.5% to 1984, 6.5% thereafter	12.5% to 1983, 5.5% thereafter	N/A	4% per annum	5.50% per annum	12.5% to 1981, 5.5% therafter
8. Average retirement age	Retirement rates varying by sex and attained age	Retirement rates varying by sex and attained age	Normal retirement age	64	62 males 60 females	50% retire @ 60/20 or 90 points, balance @ 65
9. Asset valuation method						
a) Bonds and mortgages	Discounted at valuation interest rate	Discounted at valuation interest rate	Book value	Book value	Discounted at valuation interest rate	Discounted at valuation interest rate
b) Equities	N/A	N/A	Book value	Book value	4-year market value average	Market value
c) Real estate	N/A	N/A	Book value	N/A	Book value	N/A

a Accrued actuarial liability basis.

Appendix B - Guidelines for the Valuation of Pension Plans Relating to the Ontario Public Sector (June, 1980)

CONTENTS

Guidelines for the Valuation of Pension Plans Relating to the Ontario Public Sector 154
Background 154
Approach 154

Proposed Guidelines 155
Statement of Plan Operations 155
Actuarial Method 155
Valuation Balance Sheet and Related Information 157
Timing 159

Table 1 - Cash Flow Analysis of the _____ Fund 160

GUIDELINES FOR THE VALUATION OF PENSION PLANS RELATING TO THE ONTARIO PUBLIC SECTOR

Background

Increasingly large pension liabilities have focussed attention on the need for timely and consistent information regarding pension plans in the Ontario public sector.

This information is required in order to:

1. provide management board with a consistent basis for the determination of public sector pension liabilities in order to assess expenditure requirements for each fiscal year and to aid in optimal budget management;

2. permit comparability between benefits and benefit costs across the public sector and with private sector plans;

3. allow more accurate estimates of pension contributions, benefits payable and special payments for the optimal management of provincial cash flows;

4. estimate the future availability of funds for provincial financing purposes;

5. assure the availability of accurate data on future pension liabilities in order to satisfy the disclosure requirements for external financing, and to maintain the financial integrity of the province.

NOTE: The above objectives do not apply equally to the five major pension plans. The first and the third exclude the Hydro Pension Plan, and the fourth excludes the Hospitals of Ontario Pension Plan.

Approach

A study group composed of representatives of the Benefits Policy Branch (CSC) and the Taxation and Fiscal Policy and Finance Management Branches (TEIA) developed the broad outlines of a standard approach to the valuation of pension plans in the Ontario public sector which would meet the information needs outlined above.

This approach was discussed with the administrators and actuaries of the Public Service Superannuation Fund, the Teachers' Superannuation Fund, the Ontario Municipal Employees Retirement System, the Hospitals of Ontario Pension Plans, and the Hydro Pension Plan.

The actuaries associated with each of these plans undertook to make written recommendations which would be submitted to the study group through the plan administrator.

The guidelines detailed below are based on these recommendations as well as the discussions held with the administrators and actuaries.

PROPOSED GUIDELINES

These guidelines do not attempt to establish the basis for the triennial pension plan valuation required under the provisions of the Ontario Pension Benefits Act.

They are intended to provide the basis for a common approach to the valuation of pension plans related to the Ontario public sector.

Statement of Plan Operations

It is recommended that each valuation report should contain the following:

1. A summary of the plan provisions. This summary should cover the main provisions of the plan only.

2. Mention of changes in plan benefits since the last report.

3. A description of broad investment objectives of the fund.

4. A description of financing which would include the special payments expressed as a percentage of salary.

5. Number of contributors and related payroll shown by age, sex, and service group. The service groups should be 0-4 years, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35 and over.

6. An analysis of major changes in the population profile since the last report.

7. Number of beneficiaries shown by type, age, and sex. Types include annuities or allowances payable to retirees, deferred annuitants, survivors, and disabled lives.

Actuarial Method

A projected benefit method should be used in the valuation. Actuarial liabilities associated with the accrued service and total service should be shown separately. The actuarial liability for accrued service should take the projection of salaries into account for those plans with a final average formula.

Under the projected benefit method, levels of benefit are projected for both future salary and future service. In addition, account is taken of future contributions under the plan. The levels of contributiions will vary by plan, since in some plans the employer portion is defined in terms of the employee contribution, and in others the employer contribution is more flexibile. The valuation should take these differences into account.

It would be helpful to have the value of benefits to be earned in respect of service in the year following the date of valuation. This calculation would be based on existing members and projected salaries.

Demographic Assumptions

These assumptions should reflect the characteristics of each particular plan where sufficient data are available. In many cases, it will not be possible for actual plan experience to be used because of the statistical significance of the data. In the event that a standard table is used, the standard should be identified and reasons given for its use. The particular demographic assumptions are listed below:

1. Rates of mortality for active lives, retirees, survivors, and the disabled if relevant.

2. Rates of withdrawal specified by sex, age, and years of service. The selected period could be as long as five years if appropriate. The rates will reflect terminations in which the benefit is either a return of contributions or a deferred annuity.

3. Rate of retirement to be applied to a participant who terminates and who is eligible to take a monthly income, reduced or unreduced. Because most of the plans have complex rules for retirement with an unreduced pension, these special provisions should be considered in the rates. Consequently, rates should be established for each age and sex by years of service at relevant ages and service durations.

4. Rates of disablement should be appropriate to the experience of the plan.

5. Proportion of the population married and the relationship of the husband's age to the wife's age, where available.

6. Rates on remarriage where applicable.

7. Proportion of termination employees electing vested pensions. This assumption could be covered under items (2) and (3).

Economic Assumptions

These assumptions should reflect the characteristics of the fund but a common set of principles should be used in determining the economic assumptions. An overriding consideration should be that these assumptions be realistic for the long term.

1. Rates of salary increases due to promotion, seniority, and productivity.

2. Rate of inflation (or general salary increases) should be reflected separately from item (1).

3. The interest assumption should reflect realistic estimates of the actual expected rates of return year by year in the long run.

   It would be helpful (where the plan's systems permit) to establish for each year of the initial 10-year period the rate of interest on a best-estimate basis, reflecting the yields on existing investments and the prospective yields for new investments, as well as allowing for any expected changes in investment philosophy. A single rate approximating the year by year rates in the initial 10-year period would also be acceptable, but an explanation of how the substitute rate was developed would be necessary. For the period subsequent to the initial 10-year period, a reasonable long-term interest assumption should be employed.

   Alternatively, where the plan's systems do not permit the refinement outlined above, a single rate which would provide similar results could be used. However, if a single rate is chosen, the report should outline the method used to establish the single rate.

4. The growth rate in the Year's Maximum Pensionable Earnings under the CPP should follow the terms set out in the CPP Act. For the period after which specified increases are not set out in the act, an assumption appropriate to the general inflationary conditions should be used.

Valuation Balance Sheet and Related Information

Assets

The invested assets should be presented with an attached exhibit showing each asset in the portfolio at both book and market value as well as nominal rate of return on both book and market. In the event that the assets are carried to the balance sheet at a value other than book or market, a description of the method used to establish the actu-

arial value along with reasons for using that method should be presented. Any capitalized interest should be identified.

In addition to the invested assets, the present value of future contributions from employees and future contributions from employers (where specified in the plan) should be stated. The amount of the statutory unfunded liability (under the Ontario Pension Benefits Act) should be shown as well, where applicable. Any balancing item as a result of this valuation should be identified. A breakdown of the required payments associated with the statutory unfunded liability should be included in a footnote.

Any surpluses which are used to write down experience deficiencies should be identified and included in the balance sheet.

Liabilities

The actuarial liabilities should be set out showing the portion of liability associated with active members allocated by sex showing accrued and total service separately.

If possible, it would be appropriate to allocate the active life liability to the various sources of benefits, i.e., withdrawal, disability, death, and retirement.

Liabilities associated with pensions in pay should be allocated by sex showing retirement, disability, and survivors' benefits separately.

Other Items

In addition to the items mentioned above, the present value of 1 per cent of payroll with projections over the future lifetime of the membership should be shown for males and females separately as a footnote to the balance sheet.

Cash Flow Analysis

A cash flow forecast should be provided for 10 years. This forecast should provide the information contained in the sample layout in Table 1 below. Except for the economic assumptions shown below, the assumptions used in the cash flow analysis should be the same as those used for the valuation.

1. Rates of salary increases due to promotion, seniority, and productivity should be established to reflect the increments that could be expected on a best estimate basis in the future.

2. Rates of inflation (or general salary increase). It is suggested that the inflation assumptions parallel or at least be related to the interest assumptions discussed below.

3. Interest assumptions should reflect realistic estimates of the actual expected rates of return for the next 10 years. The rate of interest should be established for each year of the period on a best estimate basis reflecting not only the yields on existing investments, but the prospective yields for new investments, as well as allowing for any expected changes in investment philosophy.

4. The growth rates in the Year's Maximum Pensionable Earnings under the CPP should follow the terms set out in the CPP Act. For the period after which specified increases are not set out in the act, an assumption appropriate to the general inflationary conditions should be used.

It will also be necessary to introduce a stream of new entrants to the plan. This new-entrant population should be realistic and related to the expected employment climate. A profile of the new members should be provided.

It would be helpful to have estimates at three-year intervals from the last Ontario Pension Benefits Act triennial valuation of possible changes in unfunded liability payments such as experience deficiencies. This could require valuations at intervals throughout the cash flow period using the cash flow projections of population characteristics and the valuation basis that would be used for the reports sent to the Pension Commission of Ontario.

Timing

Valuation dates as well as plan year-ends should be December 31 of each year.

The actuarial valuation should be updated annually. It would be necessary to have a detailed re-examination of the demographic assumptions only for the years in which a regular triennial valuation is due.

Four copies of the Annual Valuation should be forwarded to the Pension Coordinator, Civil Service Commission within fourteen months from the date of the year end. He will ensure that copies are made available to the Taxation and Fiscal Policy and Finance Policy Branches of the Ministry of Treasury, Economics and Intergovernmental Affairs.

Table 1
Cash Flow Analysis of the _____ Fund

	Revenues					Disbursements				
	Contributions		Investment income	Special payments(a) (deficiency) total	Total inflow	Benefits paid	Refunds	Adminstrative costs	Total outflows	Net cash flow
	Employer	Employee								
1977										
1978										
1979										
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										

a Footnotes:

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Initial unfunded liability											
Unfunded liability due to amendments											
Experience deficiency											
Total											

Appendix C - Canadian Institute of Actuaries: Recommendations for Valuations of Pension Plans (June 8, 1980)

CONTENTS

Part 1 - Introduction 162

Part 2 - Data 163

Part 3 - Actuarial Assumptions 163

Part 4 - Actuarial Methods 165

Part 5 - Asset Valuation Methods 169

Part 6 - Contingency Margins and Reserves 170

Part 7 - Reporting 171

Table 1 - Model Showing Basic Components of Economic Factors 173

PART 1 - INTRODUCTION

The Council of the Canadian Institute of Actuaries has approved the following recommendations for conduct of a member (hereinafter called "actuary") performing pension plan valuations.

1.01 Types of plans covered. Except where otherwise specifically excluded below, all pension plans, including plans sponsored directly or indirectly by government or government bodies as employers of public servants, are covered by these recommendations.

The following exclusions apply:

- Plans of the "defined contributions" type. However, the type of plan variously referred to as "modified money purchase" or "target benefit" or "floor plan" falls within the scope of these recommendations.

- Plans under which all benefits and all contingencies with respect thereto are underwritten and guaranteed by a company licensed to conduct annuity business in Canada. In all other cases where actuarial values are being calculated for benefits under an insurance contract, these recommendations will apply.

- Social security programs, such as the Canada Pension Plan, the Quebec Pension Plan, or the Old Age Security benefits. If, however, an actuary is called upon to value the benefits under one of these plans, he should be guided by the principles underlying these recommendations to the extent applicable.

1.02 Changes. These recommendations reflect the present state of actuarial and pension practice. The institute's policy is to change the recommendations from time to time to take account of advances in actuarial science and the evolution and the changes in the environment of pension practice. To that end, the Pension Standards Committee shall actively seek changes in the recommendations and propose them to council.

1.03 Approximations. In certain situations it may not be practicable for the actuary to carry out a valuation in as rigorous a manner as he would ideally like. In such circumstances he may make appropriate approximations provided they do not materially affect the results. He should satisfy himself that such approximations do not infringe on the general requirements of these recommendations.

1.04 Materiality. A difference is material if it is significant to a user of the valuation report. The actuary should choose a standard of materiality which will reasonably satisfy each normal user of the valuation report.

1.05 Documentation. The actuary may be called upon to justify his work. He should therefore be prepared to provide documentation supporting the rationale for his decisions in the context of these recommendations.

PART 2 - DATA

2.01 Obtaining data. The actuary should provide suitable instructions to the employer or to the source providing the data so that when received they will be sufficient and reliable for the purposes of the valuation. The actuary should obtain confirmation from his source of data that they are complete and accurate or a description of the extent to which they are not.

2.02 Establishment of check procedures. The actuary should establish suitable check procedures to test the validity of the data which form the basis for the valuation of assets and liabilities.

2.03 Plan provisions. The actuary should obtain plan documents and other information to determine the plan provisions sufficiently accurate for the purpose of the valuation. The valuation should be based on the current plan provisions except when the valuation is to include the financial effect of proposed plan changes. A brief summary of the provisions, as valued, should be included in the valuation report.

2.04 Disclosure of data source and checks. The actuary's valuation report should mention the date as of which the data were compiled, the sources of the data, any assumptions made with respect to unavailable information and should state that tests of validity, deemed suitable by him, were carried out. A summary of the statistics pertaining to the group, broken down according to significant categories should also be included in the valuation report.

PART 3 - ACTUARIAL ASSUMPTIONS

3.01 Appropriateness. The actuarial assumptions selected should reflect the actuary's judgment of future events affecting the related actuarial value. They should take into account the actual experience of the covered group to the extent that

information is available and applicable, but in recognition of the nature of a pension plan, they should also reflect expected long-term trends rather than give undue weight to recent past experience. The actuary may take into account general or specific information available from other sources, including the plan sponsor, plan administrator, investment managers, accountants, and economists.

3.02 Relationship between assumptions. The actuary should give independent consideration to the reasonableness of each actuarial assumption. He should ensure that the assumptions used by him are, as a whole, consistent and reasonable. Bearing in mind the interrelationship of the actuarial assumptions, the actuary may wish to use one or more assumptions that he does not consider independently reasonable. In such a case, the actuary may make compensating adjustments in related assumptions, to generate results which are similar to those which would follow from a set of assumptions, each of which is independently reasonable. The actuary should disclose the nature of the compensating adjustments in the valuation report.

3.03 Selecting assumptions. The actuary should make an assumption about every contingency occurring after the valuation date which materially affects the valuation results. This includes a conscious decision to ignore a given contingency where this is appropriate.

The following list, which is not exhaustive, includes typical factors about which assumptions may be necessary.

a) Economic assumptions

(i) investment return
(ii) salary increases
(iii) development of government plans
(iv) post-retirement pension adjustments

b) Decremental assumptions

(i) incidence of normal, early and deferred retirement
(ii) disability and disability recovery
(iii) voluntary and involuntary termination
(iv) mortality, before and after retirement or disability

c) Other assumptions

(i) family composition

(ii) marriage: marital status at termination, death, retirement; age differences between spouses; remarriage and divorce rates
(iii) the level of administrative expenses
(iv) election of optional forms of benefits
(v) number of hours worked by hourly-paid employees
(vi) the current composition base upon which the salary increases are to apply
(vii) future new entrants to the plan

In the choice of economic factors the actuary should have regard to their interrelationship, as demonstrated by past experience as well as by economic theories. For example, one approach is to assume that the economic factors may be broken down into their basic components as in the model shown in the appendix.

3.04 Plan changes. The actuary should give careful consideration to any change in plan design which may significantly alter the level and trend of expected future experience.

3.05 Disclosure of assumptions. The valuation report should contain a description of the assumptions that were used in the valuation. If an assumption has not been made about a contingency which could materially affect the valuation, the description should include a reference to such contingency. In the report the actuary should disclose any changes made to the assumptions since the last valuation and should indicate the effect of the changes.

PART 4 - ACTUARIAL METHODS

4.01 Choosing the method. The choice of the actuarial method to be used for a valuation will depend on the purpose and circumstances of the valuation. Such purposes may encompass:

- the funding of the plan for the purpose of setting aside assets to provide for the benefits in advance of their actual payment;

- the accounting for the costs of the plan for the purpose of properly allocating the costs between succeeding generations. This represents the costs to be charged against the current operations of the plan sponsor;

- the allocation or distribution of assets of the plan on plan wind-up, company merger, or spinoff;

- the determination of the value of benefits under the plan. This may be required for the purpose of comparison of compensation packages.

4.02 Funding of the plan

a) Selection of the actuarial method for funding. One of the fundamental purposes of funding is to provide security of benefits provided under the terms of the plan with respect to service that has already been rendered, without further recourse to the assets of the plan sponsor. In formulating his recommendations as to:

- the choice of the actuarial method for funding and

- the resulting level of funding,

the actuary should bear this fundamental purpose in mind in the interests of all plan participants. This would normally entail projection of salaries through to retirement in the case of a final or best average pay plan and a projection of post-retirement adjustments in a plan which contains a specific provision for post-retirement adjustment of pension.

The other factors which will influence the actuary's recommendations include the following:

- the value of benefits provided;

- the desired stability of future contribution levels;

- the future expansion/contraction plans of the employer;

- collective bargaining considerations;

- possible future plan changes;

- the future cash flow requirements of the plan and of the employer;

- alternative uses of money;

- tax considerations;

- specific statutory requirements;

- the profile of the current plan membership and likely future changes.

If his valuation reveals a shortfall or excess of the value of the assets, the actuary should recommend an appropriate period for the amortization of such shortfall or excess.

b) Effect of the selected method(s)

The actuary should explain to the plan sponsor the effect of the selected funding method(s) on the security of benefits and the stability and level of future contribution rates. The actuary should, in appropriate circumstances, explain the possible consequences of deficient or excessive funding.

If the actuarial method used for funding is not appropriate for the accrual of pension costs as described in Section 4.04, the actuary should disclose this in his report, so that proper provision can be made in the accounts of the plan sponsor, notwithstanding the pace of funding selected.

4.03 Accounting for the costs. Accounting practices require that the costs of the plan be charged to the current operations of the plan sponsor in a manner that will ensure a reasonable and consistent allocation of costs between succeeding years of operations of the plan sponsor. Thus, the costs will be distributed equitably between generations of shareholders, taxpayers, owners, etc., as applicable.

When calculating costs for accrual purposes, the actuary should use an actuarial method which, consistent with accounting practices, provides for the allocation of costs in a gradual manner over the working lifetimes of the plan membership. Two examples of the implication of this requirement are given below:

a) In a final or best average pay plan, salaries should be projected through to retirement.

b) In a plan which contains a specific provision for post-retirement adjustment of pension, a projection of such adjustment should also be made.

Other cases should be dealt with in a manner consistent with these examples.

4.04 Allocation or distribution of assets. In the case of plan wind-ups the actuarial valuation performed in order to determine the allocation of assets will normally entail:

- calculation of the actuarial value of the benefits accrued in accordance with the plan provisions as of the valuation date;

- if the assets are insufficient, allocation of priorities for the various benefits in accordance with the plan provisions, subject to any overriding legal requirements;

- if the assets are more than sufficient, the disposal of the surplus in accordance with the plan provisions, or in absence of specific plan provisions, in accordance with the instructions of the plan sponsor, subject to any overriding legal requirements.

When advising on the allocation of plan assets in the event of a plan reorganization or sale or purchase or reorganization of the plan sponsor, the actuary should pay particular attention to:

- the financial position of the plan as if it were being wound up, as well as on an ongoing basis;

- the equity of various employee groups;

- any agreement or understanding reached between the parties to the sale/purchase/reorganization.

4.05 Determination of values of benefits. Any comparison of values of benefits should have regard to the following:

- the comparison with respect to each element of benefit will usually be made on the basis of the same funding method and, unless the actuary otherwise deems it appropriate because of the particular circumstances of the situation, the same actuarial assumptions;

- the actuary should ensure that any differences due to the profile of the groups of employees involved do not bias his comparisons (if more than one group of employees is involved);

- when comparing different types of plans, the actuary should ensure that the comparisons are not distorted.

4.06 Disclosure of actuarial methods. The valuation report should contain a description of the actuarial methods in sufficient detail to make it understandable to another actuary. In the report the actuary should disclose any changes made to the actuarial methods since the last valuation and should indicate the effect of the changes.

5.01 Selection of the asset valuation method. The valuation of the assets and the valuation of the liabilities are interdependent and one cannot be considered in isolation from the other. The asset valuation method selected by the actuary should be such that it will produce a value of the plan's assets (cash, investments, and other property) which:

- is consistent with the economic assumptions used for the calculation of the related actuarial value of benefits; and

- provides an objective recognition of the long-term value in the context of the economic assumptions selected. This may require the removal of the effects of the short-term volatility of asset values.

The actuary should bear in mind the current market value of the assets and the past trend of market values to the extent that he has reflected these in selecting the economic assumptions.

The selection of consistent assumptions may be achieved either by considering assets, other than cash, as being represented by a series of future payments into the fund just as the liabilities represent a series of future payments out of the fund, or by discounting the liabilities using interest rates which reflect in a meaningful way the expected future yield of the assets and their re-investment, or by any other suitable method.

In the case of plan termination, merger, spin-off, etc., where the benefits have been valued at current market value, the use of market value of the assets would normally be desirable.

An asset valuation method may involve the direct discounting of the expected investment income from all or some of the assets. In such cases the actuary should give consideration to the differences in types of assets and the concomitant differences in their risk characteristics, their outstanding terms and reinvestment rates. The discounting rate used should be consistent with the economic assumptions used for the actuarial value of the benefits. For example, if a single rate of return is being used for the value of benefits (as an aggregate of a select rate for the next few years and an ultimate rate thereafter), the same rate may not be appropriate for the discounting of the expected investment income from the assets, bearing in mind that the average term

of assets will normally be shorter than the average term of benefit payments in most plans.

5.02 Disclosure of asset valuation method. The valuation report should contain a clear statement of the asset valuation method. For comparison purposes, the current book and market values of assets, if available, should also be reported. In the report, the actuary should disclose any changes made to asset valuation methods since the last valuation and should indicate the effect of the changes.

PART 6 - CONTINGENCY MARGINS AND RESERVES

6.01 Contingency margins and reserves. The actuary may introduce reasonable contingency margins and reserves in the valuation of a pension plan. For example:

- if discrepancies revealed through the checks performed on the data received are not resolved and, as a result, he does not have complete confidence in the data supplied, he may set up a specific contingency reserve;

- in making an assumption, the actuary may find it appropriate to introduce an element of caution, bearing in mind the degree of uncertainty in assumptions and the potential for adverse fluctuation regarding both assets and liabilities. In deciding the size of margins against the effect of adverse fluctuations in the experience, the actuary may take into account the size of the plan, the financial strength of the plan sponsor, and the nature of the plan's benefits. Any provision against adverse deviations may be in the form of an explicit contingency reserve;

- the actuary may provide for margins or contingency reserves in anticipation of expected benefit improvements. Such provision may be in the form of an explicit contingency reserve.

6.02 Disclosure of contingency margins and reserves. The valuation report should contain a description of the nature of any material contingency margin or reserve which the actuary has provided for - whether set up as an explicit reserve or implicitly through conservative assumptions or methods. In the report the actuary should also disclose the approximate overall financial impact of these margins and reserves and any changes made since the last valuation.

7.01 Report contents. The report on the valuation of a pension plan prepared by an actuary should contain information which will be sufficient to permit another actuary to make an objective appraisal of the valuation.

In addition to the items set out in Parts 1 through 6 of these recommendations every report should contain:

- the name and signature of the actuary directing the report and his professional affiliation;

- the name of the person or firm retaining the actuary for the report, and the purpose which the report is intended to serve;

- the effective date of the valuation;

- a summary of the valuation results in sufficient detail to satisfy the purpose of the valuation;

- the actuary's statements of opinion (described hereafter) as regards the data, the actuarial assumptions, and the actuarial method upon which the valuation is based.

7.02 Data statement. The actuary should state that in his opinion the data on which his valuation is based are sufficient and reliable for the purpose of the valuation. The actuary can so state provided that:

- he has had an adequate response to his request for the data and information that he considers sufficient and reliable for the valuation;

- he has performed such tests as he considered necessary in the circumstances; and

- his tests have satisfactory results.

If the actuary cannot make such statement, he should disclose the reasons in the valuation report.

7.03 Statement as to assumptions. The actuary should state that, in his opinion, his assumptions are "adequate and appropriate" for the purposes of the valuation. In the context of pension plan valuations:

- the word "adequate" should be interpreted as meaning "fully sufficient in view of the circumstances of the plan

and the actuary's judgment regarding the future course of events," but should not be interpreted as precluding some degree of conservatism; and

- the word "appropriate" should be interpreted as meaning "suitable in view of the circumstances of the plan and the purpose of the valuation."

He should indicate that, nonetheless, emerging experience differing from the assumptions will result in gains or losses which will be revealed in future valuations. In the case of a second or subsequent valuation, the valuation report should include a reconciliation of the valuation results and identify the sources of experience gains and losses since the last valuation, to the extent reasonable in the context of the purpose of the valuation and the number of participants in the plan.

7.04 Statement as to methods. The actuary should state that, in his opinion, the methods employed in his valuation "are consistent with sound actuarial principles" for the purpose of the valuation. The actuary can so state provided that his actuarial method for the valuation of plan benefits and his asset valuation method are consistent with each other in the context of the actuarial assumptions used for the valuation, and they comply with the recommendations contained herein.

7.05 Statement as to conformation. The actuary should state that the report has been prepared, and his opinions given, in accordance with generally accepted actuarial principles. The actuary can so state provided he has followed the principles set out in the Institute Guides, Opinions and Recommendations.

Table 1
Model Showing Basic Components of Economic Factors

Pre-retirement		
Investment return	Salary increase rate	Government benefit increase rate
1. Real interest rate	1. Real wage increase	1. Real wage increase
2. Inflation	2. Inflation	2. Inflation
3. Performance premium/ discount (reflecting superior/inferior asset management)	3. Merit/ promotional scale	3. Catch-up factor (e.g., the transitional 12-1/2 % annual increase under the Canada/Quebec Pension Plan)
	4. Industry/ company adjustment	
Post-retirement		
Investment return		Benefit adjustment
1. Real interest rate		1. Scale of adjustment
2. Inflation		2. Inflation, real wage increases and/or share of productivity (depending on the index selected)
3. Performance premium/discount (reflecting superior/inferior asset management)		

NOTES

(1) Paul A. Gewirtz and Robert C. Phillips, "Unfunded Pension Liabilities...The New Myth." Financial Executive. Toronto: Financial Executives Institute, August 1978.

Legislative History of Major Ontario Public Sector Pension Plans

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September 17, 1980

CONTENTS

Public Service Superannuation	175
Benefits	178
Eligibility	179
Contributions	180
Vesting and Locking-in	181
Portability	183
Retirement Age	184
Survivor Benefits	185
Disability Benefits	186
Fund Investments	187
Plan Administration	187
Teachers' Superannuation	187
Benefits	189
Eligibility	191
Contributions	193
Vesting and Locking-in	194
Portability	195
Retirement Age	195
Survivor Benefits	195
Disability Benefits	197
Fund Investments	197
Plan Administration	198
Ontario Municipal Employees Retirement System	200
Benefits	201
Eligibility	202
Contributions	203

Vesting and Locking-in 203
Portability 203
Retirement Age 204
Survivor Benefits 204
Disability Benefits 204
Fund Investments 205
Plan Administration 206

Hospitals of Ontario Pension Plan 206
Benefits 207
Eligibility 207
Contributions 208
Vesting and Locking-in 208
Portability 208
Retirement Age 208
Survivor Benefits 209
Disability Benefits 209
Fund Investments 209
Plan Administration 210

Ontario Hydro 210
Benefits 212
Eligibility 214
Contributions 215
Vesting and Locking-in 216
Portability 217
Retirement Age 218
Survivor Benefits 219
Disability Benefits 221
Fund Investments 222
Plan Administration 222

Notes 223

Legislative History of Major Ontario Public Sector Pension Plans

This history of the five major public sector pension plans outlines selected amendments to the specific acts governing the plans. Except for the Hospitals of Ontario Pension Plan, each plan is regulated by its own legislation in addition to the general Pension Benefits Act. Although it is often suggested that HOOPP is a private sector plan it is treated as a public sector plan because of the direct relationship of government funding of health care. The hospitals' obligation to make pension payments ultimately becomes an Ontario government responsibility. Therefore the plan is dealt with as part of the public sector.

PUBLIC SERVICE SUPERANNUATION

The original plan(1) was compulsory for full-time employees, although provision was made for employees who were temporary prior to November 1, 1920, and subsequently moved to permanent positions, to contribute from November 1, 1920. Those employed on a temporary basis after that date but subsequently transferred to a full-time position, could elect within one month to contribute for the period of temporary employment.

A pension was payable on retirement at age 70 with 10 years' continuous service or after 10 years of continuous service if termination resulted from other than misconduct, and on an optional basis at age 65 after 30 years of service. Otherwise, contributions were returned with interest at 5 per cent per annum. The pension was calculated as 2 per cent of the average of the last three years' salary multiplied by the years of service (to a maximum of 30) with a maximum pension of $2,000 per year. A retroactive amendment in the 1924 legislation set a minimum benefit of $360 per year.(2) For employees over retirement age when the plan began who retired subsequently, the annual payment was one-half their last annual salary, to the $2,000 yearly maximum. For an employee reaching retirement age before completing 10 years' service, the payment was one-tenth of annual salary for each year of service, still subject to the $2,000 annual benefit maximum.

Contributions that were made by payroll deduction, beginning in November 1920, were based on the age of the contributors and ranged from 2-1/2 per cent for those under age 21 to 5 per cent for those 45 years and over.(3) Contributions were matched by the employer from Consolidated Revenues.

Death benefits were payable to widows and children only, though the widow had to be over age 50 and have married the employee before he reached age 60. For members having 10 years of continuous service, the death benefit paid was one-half of the accrued pension; if the widow

died or remarried the allowance went to any children under age 18. If there were no widow or children the benefit was the greater of

a) a lump sum not to exceed one year's salary at the rate of the average of the last three years' salary; or

b) a return of the employee's contributions with interest at 5 per cent compounded annually.

In cases of death before completing 10 years' service, a lump-sum payment of the employee's contributions with 5 per cent annual interest would be paid. When a pensioner died before receiving an amount equal to one year's salary, his representative received either the balance, or the actual contributions made plus interest at 5 per cent less pension payments. If the deceased left a widow and children the payment was 50 per cent of the pension being paid to the widow for her lifetime or until she remarried, and then to the children until age 18.

Retirement because of disability earned a pension considered to be and computed as a superannuation allowance.

The fund was the responsibility of the Treasurer of Ontario and earned interest at the rate of 5 per cent per annum. Any deficiency was to be made up from Consolidated Revenues until such time as the fund was solvent. An annual statement had to be made to the Legislature. Administrative costs were covered by legislative appropriation.

A board was set up, composed of the President of the Executive Council who acted as chairman, the Civil Service Commissioner and one representative of the Ontario Civil Service Association, plus one member to be appointed by each recognized party in the legislature. The board decided on the entitlement to benefits.

The act also contained a provision allowing public servants who were then contributing to the Teachers' and Inspectors' Superannuation Fund to transfer to the Public Service Superannuation Fund if they so chose. Further, the act required that all married male plan members furnish proof of life insurance with a reliable company for an amount of not less than $5,000.

Benefits

The formula of 2 per cent of average salary in the last three years multiplied by years of service (to a maximum of 30) persisted until the Public Service Act, 1947 took effect, with Superannuation forming Part II of the Act.(4) At this time the maximum number of years for computation was raised to 35, the maximum payment increased from $2,000 to $3,000, and the minimum was set at $600 provided that amount was less than 70 per cent of the average salary during the last three years of service. The following year(5) an amendment allowed the best three

consecutive years' salary to be used rather than the last three. In the amendments of 1960-61(6) the maximum allowance provision was repealed. In 1961-62(7) the basis of salary for calculation was changed from the three highest years to the highest consecutive 36-month period. With the advent of the Canada Pension Plan in 1966 the basis changed in order to provide integrated benefits, with provisions for grandfathering in the case of persons employed before January 1, 1966.(8) The new basis for calculating benefits was 2 per cent of the average annual salary during the highest consecutive 60 months multiplied by the years of service to a maximum of 35 minus .7 per cent of salary up to the YMPE multiplied by the years of contributory service after January 1, 1966. No reduction occurred for persons retiring between age 60 and 65 with 20 years' contributions until they reached age 65. Nor was any reduction made for disability payments for those retiring before 1967 until CPP disability benefits became payable in 1971. Allowances were computed when CPP began for those who retired before being eligible for it. In other cases the reduction was 5 per cent per year for each year under age 65 except for persons with credit prior to January 1, 1966. In 1975(9) the minimum allowance of $600 per year was repealed.

In addition to the normal superannuation benefits, a system of compensation allowance for persons "whose services have been dispensed with" before retirement age was introduced in 1935,(10) retroactive to 1934. Based on a combination of age and service, the allowance was available to persons age 45 with 25 years' service, age 50 with 20 years' service, or age 55 with 15 years' service. It was based on the average yearly salary in the last three years, but was not to exceed one-seventieth the annual salary multiplied by a maximum of 30 years of service; the total was not to exceed $1,500 per year. In 1947(11) the maximum was set at $2,000 per year, to be based on a service maximum of 35 years. In 1953(12) an amendment provided that all employees under age 60 who were dismissed could receive compensation allowances, on a sliding scale based on age. In 1955 the age was raised to 65.(13) In 1958(14) the provision for such allowances was repealed.

In 1975, through the Superannuation Adjustment Benefits Act, S.O. 1975, c. 82, benefits were indexed to the Consumer Price Index to a maximum of 8 per cent.

Eligibility

The original definition of "employee" in the 1920 legislation was amended in 1924(15) to extend the definition retroactive to 1922 to include sheriffs of districts or counties, whether paid a salary or a fee. Also, staff of any board or commission of the government were included. In 1933(16) the meaning of employee was clarified to exclude anyone hired who could not serve 10 full years before retirement. In 1937 the period was raised to 15 years before age 70.(17) In 1941 magistrates were deemed to be employees if they were under age 55 on January 1, 1941, were appointed after that date and were under age 55,

or could serve 15 years before retirement.(18) In 1948(19) some jailers and jail employees were covered, with provision for back payment. The act also applied to deputy magistrates and full-time judges or deputy judges of family or juvenile courts. Amendments in 1952-53(20) extended coverage to County Registrars of Deeds and their full-time permanent employees. In 1955(21) Magistrates' full-time court staff became eligible. In May of 1956 married women were allowed to contribute. In 1962 it was provided that jailers and jail employees appointed after August 1 would not be covered.(22) From 1971(23) the act applied to the permanent staff and the full-time probationary staff of any board, commission, or foundation established under any act of the legislature that is designated by the Lieutenant-Governor in Council and to any full-time employees in designated positions whose request for coverage is approved by the Lieutenant-Governor in Council.

Contributions

The sliding scale of percentages based on the age of contributors persisted until 1936 when a rate of 4 per cent of salary was fixed for all members.(24) Beginning on March 1, 1948 the rate depended on the level of salary and length of service. For persons whose continuous service began before March 1, 1948 the rate remained at 4 per cent; for those beginning on or after that date the rate was set at 5 per cent for persons earning less than $1,500 per annum, and 6 per cent for those earning $1,500 or over.(25) In 1957(26) the rate was changed to 6 per cent of salary for all contributors. In 1966, when the Canada Pension Plan was introduced, the contributions were integrated. From that time members contributed at the rate of 6 per cent up to the YBE, 4.2 per cent between the YBE and the YMPE, and 6 per cent above the YMPE. Minimum age for contributions was set at 18, in line with the CPP.

The employer matched employees' contributions out of Consolidated Revenues until the amendment of 1974 which required the employer portion to come from legislative appropriation.(27)

Employees' contributions are subject to maximum age limitations; when mandatory retirement at age 70 was legislated in 1931, it was provided that superannuates might be rehired but might no longer contribute to the fund,(28) though further service could be counted toward the eventual reinstated pension. In 1965(29) it was provided that contributions should cease at age 65 except for persons who had been employed and were over age 50 on March 1, 1948 who were permitted to contribute to retirement or age 70 whichever came first; persons under age 50 and employed on March 1, 1948 but reappointed when over age 65 who were allowed to contribute to retirement; those age 70 or with 30 years' continuous service whichever was earliest, and magistrates appointed before May 1, 1952 who could contribute until reaching the retirement age for magistrates (age 75). In 1966(30) contributory age was rationalized with the new Canada Pension Plan, and contributions ceased at termination of employment in the public service or age 70,

excluding magistrates appointed before July 1, 1941 who were under the aegis of the Magistrates' Act and could continue to contribute until age 75. However, an optional cessation of contributions over age 65 existed. Any employees over 65 and still employed on July 8, 1966 were permitted to elect within six months to contribute beyond age 65.

Contributions for past non-contributory service, such as temporary employment, continued to be permitted by legislation. In 1946(31) persons moving to a permanent position were permitted, upon notice to the board within three months of appointment, to contribute for past continuous temporary service plus interest at 3 per cent per annum. In 1947(32) the provision was amended to allow notice to be given within six months of the amendment's coming into force or within three months of appointment. In 1956(33) it was provided that the election to contribute for continuous casual service had to be made by December 1, 1956 or three months from the date of appointment, whichever was later. Beginning in 1957(34) the rate of contribution depended on the date of hire, with those employed permanently after April 1, 1957 contributing 3 per cent of salary, those employed before April 1, 1957 paying 4 per cent to April 1, 1957 and 6 per cent thereafter, or 6 per cent overall, with payments to be subject to interest at 5 per cent per annum. Notice of intent to contribute was to be given before March 31, 1959. In 1964(35) the provision was amended to allow those appointed on or after April 1, 1964 to contribute with interest at 3 per cent, subject to notice of intent within one year of appointment. For those appointed to permanent positions before April 1, 1964 the option remained open until December 31, 1965 to elect to pay, with interest at 5 per cent per annum. By 1971(36) the provision was widened to allow contributions for non-contributory service immediately prior to appointment to be made any time before ceasing to be an employee.

In 1974(37) credit for military service allowed for back contributions at 12 per cent of salary and covered military service in World War II and Korea. In 1975(38) coverage was widened to include the merchant marine.

Pursuant to the Superannuation Adjustment Benefits Act, an additional contribution of 1 per cent by the employee and 1 per cent by employer is paid on account of indexing.

Vesting and Locking-in

Although statutory vesting and the locking-in rule of age 45 and 10 years' service was not in effect until 1965, deferred annuities to terminating employees with 10 years' service have been available under the Public Service Superannuation plan since 1958. Before that time a return of contributions was provided upon termination of employment. The original act that provided for interest at 5 per cent was amended in 1933(39) so that contributions made before May 1, 1933 earned 5 per cent, those after that date earned 3 per cent. However, if a job was

abolished or the employee was disabled or reached retirement age before having a pension, the interest earned was at 5 per cent. The Public Service Act 1947, (Part II)(40) provided a return of contributions only for persons employed less than three years, otherwise interest was at 3 per cent. This provision was also applied to contributions to the Public Service Retirement Fund under Part III of the Public Service Act in 1952.(41) Beginning in 1958(42) annuities were payable for persons who had contributed for 10 years or more, provided they were under age 50 when continuous service began, as follows:

- those ceasing employment before age 65 received a deferred annuity at 65;

- those ceasing employment after age 65 earned an immediate annuity;

- those ceasing employment after age 50 but before age 60 received an immediate annuity, with the approval of the Lieutenant-Governor in Council, as did former contributors with deferred annuities.

The annuity was the accrued pension reduced by 1 per cent per year for each year of service less than 20.

In 1960-61(43) a deferred annuity at age 60 became payable for those with 10 years' contributions who ceased employment before age 60. The maximum age 50 for service was repealed.

In 1965(44) benefits were locked-in at the statutory age 45 with 10 years' service. Beginning in 1966(45) employees who entered the public service on or after January 1, 1966, who ceased employment before age 65 after 10 or more years' service, earned a deferred annuity at age 65, with the approval of the Lieutenant-Governor in Council an immediate annuity on cessation of employment after age 55. Those with deferred annuities might convert them to immediate annuities after age 55, with the approval of the Lieutenant-Governor in Council. Anyone who qualified for a deferred annuity before January 1, 1966 and was age 50 or more, or anyone with credits before January 1, 1966 who ceased employment after age 50 but before age 60, or who had a deferred annuity and was at least age 50, earned an immediate annuity, with the approval of the Lieutenant-Governor in Council, computed as of December 31, 1965. Beginning in July of 1966 unvested contributions were returned with interest at 3 per cent per annum to July 8, 1966 and 3 per cent per annum compounded semi-annually. In 1975(46) the interest rate was increased to 5 per cent per annum compounded annually. Current provisions allow for a vested pension after 10 years of contributory service and locking-in at age 45 with 10 years' service, in which case a deferred annuity is payable at age 65.

Portability

The original legislation allowed for transfers between the Teachers' and Inspectors' Superannuation Fund and that of the Public Service, provided election was made before July 1, 1920. The option continued under the 1927 Act(47), and in the case of employees appointed after July 1, 1927 notice was required within 30 days of hire. The provisions of the 1937(48) amendments required interest to be paid at 4-3/4 per cent compounded annually on any transfers, with the requirement for notice continuing to be 30 days. In 1941(49) provision was made for transfers to the pension plan of the Civil Service of Canada. Revisions in 1948(50) allowed for transfers to the civil service of any municipality and expanded the provisions of the transfers to the Teachers' Fund. Persons employed after March 1, 1948 could elect within 60 days to transfer credits; those employed on or before that date who had withdrawn contributions could reinstate credits with interest at 4-3/4 per cent compounded semi-annually. But any credit on transfers from the Teachers' Fund could not exceed 18 years' service or 70 per cent of the credit in the Teachers' Fund. With the formation of the Public Service Retirement Fund in 1951 the right to transfers continued, and credits were transferable between the Retirement Fund and the Superannuation Fund. In 1953(51) the matter of teachers' transfers was clarified to allow for a maximum credit of 20 years of service and 70 per cent of credits in the fund. In 1960(52) interest on the transfers from the Retirement Fund to the Superannuation Fund was set at 3 per cent per annum. Amendments in 1961(53) included transfers to any province in Canada and allowed for the signing of reciprocal agreements. In 1965(54) credits were allowed to be transferred with accumulated interest and election was required within 60 days of appointment. In 1966(55) credit was increased to 100 per cent of continuous service or 70 per cent of continuous and non-continuous service still with the 20-year maximum. There was provision for retroactivity upon application in writing.

In 1970(56) transfers were allowed between the Public Service Fund and any Crown Corporations of Canada or the provinces. In 1971(57) the staffs of universities and colleges were added. Amendments of 1974(58) allowed transferring to the Canadian Forces and chaplaincy service, and establishing prior service with approved employers, if double contributions plus interest were paid. In addition, transfers to the Teachers' Fund were at 6 per cent interest compounded annually. In 1975(59) transfers were extended to the staff of any government-related agencies or public institutions assisted by monies from legislative appropriation or any corporations whose controlling interest is owned by Ontario. As of March 31, 1978, the plan had reciprocal agreements with the following bodies:

Alberta Civil Service Superannuation Fund
Anglican Church of Canada Pension Fund(a)
British Columbia Civil Service Superannuation Fund
Canada Public Service Superannuation Fund
Canadian Broadcasting Corporation Pension Fund
Central Mortgage and Housing Corporation Pension Fund
Evangelical Lutheran Church of Canada Pension Fund(a)
Hospital for Sick Children Employees Pension Fund
Hospitals of Ontario Pension Fund
McMaster University Pension Fund
Manitoba Civil Service Superannuation Fund
New Brunswick Civil Service Superannuation Fund
Ontario Hydro Pension Fund
Ontario Municipal Employees Retirement System
Ontario Research Foundation Pension Fund
Ontario Teachers' Superannuation Fund
Prince Edward Island Civil Service Superannuation Fund
Queen's University Pension Fund
Retirement Pension Plan of Colleges of Applied Arts and Technology
Saskatchewan Civil Service Superannuation Fund
Saskatchewan Power Corporation
Toronto Western Hospital Employees Pension Fund
Trent University Pension Fund
United Church of Canada Pension Fund
University f Guelph Pension Fund
University of Ottawa Pension Fund
University of Toronto Pension Fund
Workmen's Compensation Board Superannuation Fund
York University Pension Fund

a Applies only to Ontario public service chaplains.

Retirement Age

The original provisions of the legislation allowed for retirement at age 70 with 10 years' service, at age 65 with 35 years' service, or for disability after 10 years' service. An amendment in 1924(60) retroactive to 1923 allowed for a superannuation payment upon forced retirement, other than for misconduct, after 25 years' service. In 1928(61) mandatory retirement was legislated for persons age 60 with 25 years' service, and in 1933(62) an optional retirement provision of age 65 with 25 years of service was introduced. The 1947 legislation(63) provided for a pension for those at age 65 with 15 years' service, or at 60 with 25 years' service; for those over age 55 at the time of enactment, or at age 70 with 15 years of contributions (10 years in the case of someone hired before June 25, 1937). The following year(64) this last provision was amended to apply to persons age 50 and over on March 1, 1948.

An amendment in 1961-62(65) which provided for a pension at age 60 with 20 years' service was extended in 1966(66) to age 65 with 10 years' contributions. In 1971(67) provision was made for a pension when age and service totalled 90 for those retiring after November 1, 1971. These provisions are in effect today.

Survivor Benefits

Apart from the death benefit payable under the 1920 legislation, married male employees were required to submit evidence of $5,000 life insurance. The amount was lowered to $2,000 in the 1922(68) amendments and the provision repealed in 1937.(69) From October 1, 1965 group life insurance covered all public servants.

The survivor benefit provisions were amended in 1928(70) so that no pension was payable either to a widow who had married the deceased after his superannuation began, or to any of her children. In 1933(71) provision was made for payment of the accrued allowance or a return of contributions with 5 per cent interest compounded annually in case of death before retirement where no widow or children survived. Where death occurred after retirement but before one full year's allowance was received, and no widow or children survived, the amount paid to a representative of the deceased was the balance of the allowance for the year or the difference between contributions made and the pension already received. In 1938(72) provision was made for contributions to be refunded at 5 per cent annual interest or for such interest to be added to contributions in cases where a lump sum of the difference between contributions made and benefits received was being made to the estate. In the 1947 Act(73) death before retirement entitled the personal representative of the deceased to a lump-sum payment of twice the contributions with interest at 3 per cent per annum. The death of a pensioner entailed payment of contributions with interest at 3 per cent less benefits paid, and where the employee or pensioner was a widow, her children under age 18 were entitled to benefits. In 1958(74) the survivor benefit to a widow was one-half the annuity to the employee. If no widow survived, or if she died or remarried, the allowance was paid to any child under age 18. If no widow or children survived, a refund of contributions at 3 per cent less benefits received was paid.

Amendments in 1960-61(75) provided for payment to begin on the first of the month following the month of entitlement, and to cease on the last day of the month in which disentitlement occurred, rather than beginning on the day after entitlement, as provided for in the 1920 Act.

Beginning in July 1966(76) the allowance to a widow or children was half the accrued pension to age 65, and a dependent widower's benefit was payable on the same basis if the marriage had lasted at least one year at the time of the employee's death. Although no allowance was paid in the case of a widow who married the pensioner after superannu-

ation began, a refund was paid of twice the contributions with interest, less pension benefits paid. In cases of death before eligibility for CPP survivor benefits (January 1, 1969), the pension was calculated on the old formula, otherwise the allowance was reduced by 5 per cent per year for ages less than 65 to a maximum of 50 per cent. Amendments in 1969(77) recognized the common-law widow in cases of co-habitation of seven years if there was a hindrance to the marriage, or in cases where the couple had lived together for a number of years, representing themselves as husband and wife.

In 1971(78) payments of refunds where no pension was payable because service was under 10 years were extended to widowers. In 1974(79) the definition of a dependent child was enlarged to include those in school or university full-time up to age 25. Amendments in 1975(80) recognized the common-law widower and reduced the requirement in both cases to 12 months' cohabitation. In cases of legal separation where a spouse was not entitled to the benefits, children of the marriage were still protected. When a spouse cannot be found, the board may direct that monies go to children or the estate.

Disability Benefits

The original provision in cases of disability allowed for a superannuation allowance of the 10 years of service. In 1933(81) an amendment provided for a refund of contributions with interest at 5 per cent per annum in cases of retirement for ill health before a superannuation allowance could be paid. In 1947(82) the provision of 10 years' minimum service was reintroduced, and the maximum and minimum payments of $3,000 and $600 for the superannuation payment applied to disability payments from all sources. The allowance was payable to persons retired by the Lieutenant-Governor in Council if the board found them incapable of performing their work. In cases of recovery, if re-employment was not accepted by the pensioner, the allowance ceased. If the allowance paid was less than contributions made by the pensioner, the balance was refundable in a lump sum with interest at 3 per cent per annum. The 1952(83) amendments required 10 years of service and provided allowances to persons hired more than 15 years before retirement age who were retired because of ill health. Those who were retired for incapacity, and not entitled to disability allowances, received a lump-sum payment of twice the employee contributions plus interest at 3 per cent. In 1966(84) the age restriction was lifted. In 1969(85) it was no longer necessary to have been retired from service by the Lieutenant-Governor in Council. In 1971(86), in cases where re-employment offers were not accepted by recovered pensioners, a deferred or immediate annuity was payable. Beginning in 1974(87) employees qualifying for long-term disability continued to accrue superannuation credits while off work.

Fund Investments

The original fund was supplemented from Consolidated Revenues until such time as it became solvent. Amendments in 1931(88) provided for investment of the fund in Ontario bonds or guaranteed securities earmarked for the fund. The auditor was required to make an annual report. In 1947(89) it was required that the report be tabled in the legislature by the Treasurer who was custodian of the fund. This act also provided that Consolidated Revenues pay to the fund 5 per cent per annum interest, compounded annually at the end of each fiscal year on the uninvested balance at the beginning of the fiscal year. Any deficiency in the fund was to be paid from Consolidated Revenues. In 1951-52(90) the Public Service Retirement Fund was established. Consolidated Revenues credited 3 per cent interest on the balance, and credits were transferable to the Public Service Superannuation Fund and the Teachers' and Inspectors' Superannuation Fund. An annual audit continued to be required for both funds, with the auditor's reports and the annual reports tabled by the Treasurer. In 1965(91) it was provided that interest of 5 per cent per annum be provided by Consolidated Revenues for any unfunded liability. The Public Service Retirement Fund was repealed as of April 1, with credits transferred to the Public Service Superannuation Fund. The following year(92) the interest rate on the fund was set at 3 per cent per annum compounded half-yearly. In 1974(93) the provision for payment of the unfunded liability was repealed. In 1975(94) interest was set at 5 per cent per annum compounded annually, unless otherwise stated.

Plan Administration

The plan is administered by the Public Service Superannuation Board which was established at the time the legislation was passed. There have been only three changes to its composition since inception. In 1932(95) the legislation provided for three members appointed by the Lieutenant-Governor in Council, one of them to be a representative of employees in the Ontario Civil Service. In 1959 the board was expanded to four members(96): the Chairman of the Civil Service Commission was to act as an ex-officio member and the other three members, one of whom was to be a representative of the Civil Service Association of Ontario, were to be appointed by the Lieutenant-Governor in Council who also designated one of them to act as Chairman of the Board. Lastly, in 1974(97) the board was to comprise four members to be appointed by the Lieutenant-Governor in Council, one of them to be a representative of the Civil Service Commission, and one to represent the Civil Service Association of Ontario.

TEACHERS' SUPERANNUATION

The Teachers' and Inspectors' Superannuation Act of 1917(98) was the basis of the plan in existence in Ontario today, though efforts to

provide pensions for teachers predated its passage by more than 50 years. Various vehicles were used to this end.

The legislation of 1917 provided for compulsory coverage for those employed as teachers and inspectors. "Employed" was defined as follows:

> "Employed" shall mean and include:
>
> 1. Engaged in Ontario in teaching in a public school, separate school, continuation school, high school, collegiate institute, provincial normal or model school, a school to which the Industrial Education Act applies, a faculty of education approved by the minister, and including its attached observation and practice school, the Ontario School for the Deaf or the Ontario School for the Blind;
>
> 2. Engaged in Ontario as an inspector of public sectors by a county or other municipality;
>
> 3. Engaged by the minister, or by the government, as an inspector or a supervisor of any grade or department or class of such schools, or as Superintendent of Education, or as any other officer designated by the minister as being engaged in work in connection with the administration of the Ontario Department of Education requiring the professional qualifications and experience of a teacher.(99)

Beginning in April of 1917, members contributed 2-1/2 per cent of salary, by payroll deduction, an amount which was matched by a grant from provincial Consolidated Revenues. "Salary" was deemed to be a minimum of $550 annually, but in cases where it was less than this amount the maximum and minimum pensions payable according to the benefit formula were prorated. The benefit was one-sixtieth of the average salary for the last 10 years multiplied by the number of full years of service. The service requirement for a full pension was 40 years. Minimum payment was set at $20 per year of service and the maximum was $1,000 per year unless actual contributions would have bought a larger annuity when calculated according to Dominion Government Annuity rates then in force. In such cases the latter amount was the amount of the pension.

Any years of contributions to the fund were counted as full years for benefit purposes; any years of service before contributions came into effect were counted as half years. Pension credits already existing under school boards' plans could be transferred to the new plan on an actuarially-equivalent basis. The earlier fund was wiped out and no further contributions were to be made to it. Service also included military service "in defence of the empire"(100) including nursing services. A reduced pension was available after 30 full years of

service and in cases of invalidity after 15 years' service. Although the pension was terminated in cases of re-employment after retirement, further service credits could accrue. The death benefit was a simple return of contributions.

A commission, established to administer the plan and approve the benefits, was composed of three members appointed by the minister, one an actuary, and two members elected by and from the membership of the Ontario Education Association who were contributors to the fund. The minister designated one member to act as chairman for a three-year term.

An actuarial valuation was required to be performed on January 1, 1921 and every three years thereafter. Legislation also stipulated that if the fund could so provide, benefits should be added to the plan, as follows:

1. a return of contributions upon termination after at least five years' service;

2. a death benefit after retirement such that the pension payments already made plus the said death benefit were at least equal to the deceased's contributions.

The legislation has been amended almost every year since its passage, and in many cases changes were made by amendments to the Schools Act which ensured consistency in matters relating to the education field.

Benefits

The original formula in the 1917 legislation was one-sixtieth of average salary in the last 10 years multiplied by the number of full years of service - 40 years being deemed "full" pension. In 1920 an amendment through the Schools Act(101) added a provision of an extra $1 for teachers or inspectors having first or second class provincial certificates, or first class country board certificates, and for principals of high schools or collegiate institutes. A further amendment by means of the school laws(102) in 1933 provided that "average salary" was to be based on the average salary during the last 10 years of employment or the average salary during the years of contribution, whichever was greater. The maximum pension was not to exceed 60 per cent of the average salary.

In 1934 service for a full pension was reduced to 39 years(103) and in 1936 the plan moved to a career average formula based on 39 years maximum.(104) In 1943 the definition of service included service in the navy, army, and air force.(105) Changes in 1945(106) which increased the minimum annual salary for benefit calculation to $800 from the original $550, resulted in a minimum benefit of $500 per annum or 60 per

cent of the amount of average salary, if less than the deemed minimum of $800. The maximum benefit was raised from the original amount of $1,000 to $1,500, still with the provisions concerning the dominion government annuity calculation in cases where actual contributions would have resulted in a pension greater than the maximum. Service was reduced to 36 years for full benefit, still on the career average formula. A specified retirement age came into effect (see section on Retirement Age) but provision was made for a full pension to be payable after 40 years of service, regardless of age. Pensions for those with 30 years' service were also calculated at an unreduced 60 per cent.

Minor amendments in an otherwise comprehensive revision to the Teachers' and Inspectors' Superannuation Act in 1946(107) eliminated the $500 annual minimum pension, but stipulated that after 30 years of service a minimum of $7 per year employed would be provided. The amendments also defined "salary" as including a cost-of-living bonus but not overtime payments for special services. A further comprehensive revision, including a change in the name of the statute in 1949(108) included the following changes to benefit calculation:

- the formula moved to one of 50 per cent of the average salary for the last 15 years of contributions times years of service;

- service years were reduced to 35 (at age 62);

- full pension continued to be paid after 40 years of service regardless of age; the full 50 per cent rate was used for retirement with 30 years of service; or for 25 years of service with five of them after age 55 for those retiring after age 62;

- minimum salary was deemed to be $1,000 per annum, for benefit purposes;

- a minimum pension of $600 and a maximum of $3,000 were instituted, waiving the maximum under the 1946 legislation;

- all payments were increased by $120 per annum from April 1, 1949, and actual pensions that were less than $600 per year were raised to $600;

- the legislation stipulated that retirement after April 1, 1949 would come under the provisions of the new act, and retirement before that date would fall under the terms of the 1946 legislation, but be subject to the $600 pension minimum and the $120 increase.

The following year the statute was again amended,(109) so that persons retiring after less than 25 years of service would receive the equivalent benefit to a government annuity purchase with the joint contributions, and those with 25 or more years of service would receive the

greater of the government annuity equivalent or the regularly-calculated amount. In 1953 the maximum pension of $3,000 was deleted(110) and pensions being paid were reviewed in the light of this amendment, as at April 1, 1953. In the following year the basis of calculation was moved to the average of the last 10 rather than 15 years.(111) The provisions of a 1955 amendment allowed for the recalculation of benefits based on the 1954 move to a 10-year average.(112)

The current benefit formula of a 2 per cent benefit for the average of the best seven years' salary to a maximum of 35 years' service was adopted in 1966,(113) with a reduction of .7 per cent up to the year's maximum pensionable earnings of the recently created Canada Pension Plan, after 1965. The years of service which had previously been termed "school years" became "years of service;" the $600 minimum pension was eliminated; and provision was made for a 5 per cent reduction in benefits for persons aged 61 and over but not yet age 65, and of 5 per cent per year below age 62 for those under age 61 at the time of retirement. In 1967(114) the plan was amended to remove the provision for reducing benefits in the case of persons retiring after age 62 but before their Canada Pension Plan benefits became payable. In the 1968-1969 session the minimum annual pensionable salary was increased to $2,000.(115)

In 1975, the Superannuation Adjustment Benefits Act, S.O. 1975, c. 82, provided for indexation of benefits to the Consumer Price Index to a maximum of 8 per cent.

Eligibility

Plan membership has been compulsory since the legislation in 1917; coverage started immediately for inspectors and teachers in those schools then in existence. Over time the definition of "employed" has been expanded or modified to encompass the changing form of education in the province. In 1918(116) coverage was expanded to cover those teaching returning soldiers and sailors, and to allow contributions by persons in the armed forces. In 1919 further expansion included those in certified industrial schools or "any public institution supported in whole or in part by contributions from the province or from a municipal corporation."(117) By amendments of 1922 officers of any association or body of teachers were added and teachers from overseas were not required to contribute to the fund, while Ontario teachers serving elsewhere retained the option of continuing membership.(118) In 1932 the definition of "inspector" was enlarged to include "an inspector of the Penny Savings Bank."(119)

The amendments of 1941 expanded the definition to include non-teaching posts of persons "engaged in Ontario by a board in work demanding the professional qualifications and experience of a teacher."(120) The Act of 1946(121) excluded certain part-time categories and redefined employed as "engaged."

1. d) (i) as a teacher in or inspector of a public school, separate school, continuation school, high school, collegiate institute, provincial normal or model school, a school to which the Vocational Education Act applies, the Ontario College of Education, or the University of Toronto Schools,

(ii) as a teacher in or inspector of a school or class supported in whole or in part by contributions from the province or from a municipal corporation, and designated by the regulations,

(iii) as a teacher in or inspector of a school outside of Ontario under a system of exchanging teachers, or otherwise, authorized by the Minister,

(iv) as an officer of an association or body of teachers engaged in advancing the interests of education and designated by the regulations, or

(v) by the Minister or a board in any capacity designated by the regulations, but no person shall be deemed to be employed who,

(vi) is a member of the staff of a technical or vocational school but, not being a teacher by profession, pursues some other occupation or calling,

(vii) is engaged only for part-time to teach music, art and crafts, physical and health education, home economics, industrial arts and crafts or any other special subject,

(viii) is a teacher or inspector regularly engaged outside Ontario who is performing services in Ontario under a system of exchanging teachers, or otherwise, approved by the Minister, or

(ix) is a contributor to the Public Service Superannuation Fund established under the Public Service Act.

The 1949 Bill which dropped "Inspectors" from the title left basically the same definition of "employed" for teachers as had prevailed in 1946. This bill added schools for discharged soldiers, sailors, and airmen, and set a minimum of 20 hours' teaching per week (regardless of subject) for coverage.(122) The following provision was also added:

"Every person on the instructional staff of any normal school in Ontario, the Ontario College of Education, the University of Toronto Schools, the Ontario School for the Deaf, the Ontario School

for the Blind, the Province of Ontario Correspondence Courses, or the Royal Ontario Museum who was a contributor to the Teachers' and Inspectors' Superannuation Fund on the 1st day of July, 1946, shall notwithstanding any of the provisions of the act and so long as he remains on any such instructional staff and so long as he does not contribute to any other superannuation fund to which the Crown contributes, be deemed to be employed within the meaning of this act."

In 1950 "railway-car schools" were added to the list,(123) and as institutions, community, and technical colleges were established throughout the 1950s and 1960s coverage was expanded to the staff.(124) Provision was made for privately-funded schools to deduct contributions and provide coverage for their teachers.(125) In addition, as plans were established in institutions like universities, community colleges, or the Ontario Institute for Studies in Education, employees were given the option of having their own plan or remaining in the Teachers' Fund.(126)

Contributions

Typical of public sector plans, the one covering teachers and inspectors has been contributory in nature since inception. The original contribution was by payroll deduction in equal instalments that amounted to 2-1/2 per cent of annual salary. This was matched by the province which set aside sufficient funds once a year. In 1919 it was directed that contributions from teachers whose salary was paid in part by an employer other than a school board should nonetheless be based on the whole salary and not just the portion paid by the school.(127) This provision was amended in 1943(128) and from that point on salary and service credits were prorated according to time spent and salary earned as an employee of a school board, with contributions based on the portion of salary.

The rate of contribution remained unchanged until 1936 when it was raised to 3 per cent of salary for employees; the province continued to contribute at the rate of 2-1/2 per cent.(129) In 1944 it was decided that the province should match the employees' contributions,(130) and the following year the rate was increased to 4 per cent.(131)

The 1946 Act(132) allowed for direct contributions by employees who were on leave of absence for various reasons as defined by regulation, who were employed full-time for special subjects, or were employed by boards that refused or neglected to withhold contributions from salary. Payments, in such cases, could be made without interest (if within certain time limits) and were matched by the province, thus maintaining continuous coverage under the plan. The provisions of the 1949 Act(133) which raised the employees' contribution rate to 6 per cent also stated that the province would advance only two-thirds of the contributions made voluntarily. In 1955 the provision was again amended so that the

province would contribute two-thirds of the regular contributions but would match any special or back-contributions.(134) In 1957 the province reverted to matched contributions for all cases.(135) Contributions were integrated with those required by the Canada Pension Plan, and in the 1968-1969 legislation the rate stipulated was 6 per cent below the Year's Basic Exemption (YBE), 4.8 per cent between the YBE and the Year's Maximum Pensionable Earnings (YMPE) and 6 per cent above the YMPE. This formula was matched by the employer and remains in force today with the addition of 1 per cent employee and 1 per cent employer contribution for the indexing of benefits.

Vesting and Locking-in

The 45 and 10 statutory vesting rule came into force in 1965. Prior to that time employee contributions were handled differently if the employee had five or more years' service. The original 1917 legislation stipulated that, if possible, the fund should return contributions upon termination after at least five years' service. The legislation of 1936(136) provided that upon termination after five years of service the member would receive a return of contributions with interest at the rate of 4 per cent from the date of "retirement" to June 30, 1936 and at the rate used by the Province of Ontario Savings Office from July 1, 1936 to the date of the refund, compounded half-yearly. In 1946(137) the legislation was amended to provide a return of contributions with interest at 1-1/2 per cent compounded half-yearly in cases of withdrawal from service after five years, and a forfeiture of contributions for under five years of service unless employment was less than 20 days. In addition, provision was made for a return of contributions with interest at the rate of 4 per cent compounded half-yearly, in cases of forced retirement before pensionable age. The 1949 Act(138) allowed for interest of 1-1/2 per cent compounded half-yearly to March 31, 1949 in cases of less than five years' service, with no refund payable until a full three months after cessation of employment. The 1950 amendments(139) extended the refund of contributions at 4 per cent compounded half-yearly to cases of forced retirement because of age, and provided that interest payable should be on each amount for the length of time it was in the fund. The forfeiture of contributions in cases of less than five years' service was repealed in 1953.(140) The 1961-62 legislation(141) provided that if a person was retired because of age with at least 15 years' service, or five or more years after age 55, contributions would be refunded with interest at 4 per cent compounded half-yearly. The provision eliminating refunds after age 45 and 10 years' service came in 1964(142) following the proclamation of the Pension Benefits Act, as did the right to a deferred pension at age 65 if forcibly retired because of age. Such a deferred pension would be on an actuarially-equivalent basis if the retiree was over age 55. In 1966(143) the legislation allowed for a refund for persons ceasing employment before age 45 even with 10 years' service. In other cases a deferred pension was available and the minimum five years' service for a return of contributions (with 3 per cent interest) in case of death was

repealed. Current provisions are 10 years' service for a vested benefit, and age 45 with 10 years' service - the legal minimum - for locking-in.

Portability

As early as 1944 an amendment by way of the Schools Act(144) provided that credits could be earned in the plan for service in other provinces, and that credits with accumulated interest could be carried to other provinces' plans on behalf of former Ontario teachers. Agreements for transferability within the public sector were made throughout the 1960s, and in 1966 it was provided that 3 per cent interest would be allowed on such transfers.(145)

Retirement Age

Years of service rather than age governed entitlement to a pension in the early years of the teachers' plan. When service was reduced to 36 years in the 1945(146) amendments it was provided that males should have attained age 65 and females age 62. The Act of 1949(147) allowed for retirement at age 62 with 35 years' service. When the plan was integrated with the Canada Pension Plan, allowance was made, as seen in the section on vesting and locking-in, for unreduced benefits for those retiring at the normal age for the plan but before entitlement to CPP benefits, until the two retirement ages could be brought together at 65. In 1971(148) provision was made for retirement at age 62 with 35 years' service for persons retiring on or before November 30, 1971, and with a combination of age and service totalling 90 for those retiring after that date.

Survivor Benefits

The original provision of the 1917(149)legislation in cases of death of an employee was a simple return of contributions. The 1921(150) amendments recommended that if the fund would allow, interest should be provided on such refunds. In 1922 the interest rate was set at 5 per cent.(151) The amendments of 1925(152) changed the rate to 4 per cent compounded half-yearly. In 1932 a provision allowed employees to elect, three years before retirement date, either a joint life annuity or a surviving spouse pension,(153). In 1933(154) contributions were to be returned with interest at 3 per cent, and in 1936 it was provided that the interest rate on refunds upon the death of an employee or pensioner would be the rate in effect at the Province of Ontario Savings Office at the time of the refund.(155) Amendments of 1945(156) allowed for the option of a half pension to the surviving spouse of married plan members, or to any other dependent in the case of other members. In 1946(157) the interest rate was reduced to 3 per cent per annum compounded half-yearly; in cases of death before retirement, contributions were returned, and when death occurred after retirement the refund was a return of contributions plus 3 per cent interest less benefits paid plus 3 per cent interest. The Act of 1949(158) ushered in a survivor benefit

provision much closer to those in effect in pension plans today. It provided for the payment of 50 per cent of the accrued or actual pension to the widow of a plan member, and an allowance to dependent children under age 18. If there was no surviving spouse 50 per cent of the accrued or actual pension went to the dependent child. The allowance did not apply in cases of a marriage occurring after retirement or age 60, or to the widow's children in such cases; the widow's pension terminated on her remarriage. Provision was also made for a pension to dependent widowers of female plan members if the couple had been married for 10 years at the date of death or retirement whichever was earlier, and to any dependent children of the female plan member. The allowance, with a minimum figure of $300 per year, began as of the day following the plan member's death. In cases where a dependent's allowance ceased before payments with interest at 3 per cent equalled the deceased's actual contributions with interest at 3 per cent, the difference could be paid to the plan member's representative.

In 1950(159) the dependent's allowance provisions were extended to include allowances for the following:

- plan members who terminated employment before retirement age for reasons other than ill-health but who manifested the intention of becoming re-employed;

- children of widows or children of married women who supported such children at the time of her death, if the widower did not qualify for the spouse portion of the allowance;

- all children, including adopted or stepchildren.

In 1955(160) the dependent's allowance minimum ($300 per year) was extended retroactively to the widow and/or children who, as of April 1, 1954, would have been entitled to the allowance had the plan member died after April 1, 1949. In 1964(161) a deferred dependent's allowance was added, and any allowance payable after April 1, 1964 was to begin on the first day of the month following the month of death, rather than the day after death. The 1966 amendments(162) provided that the deferred benefit was to be 50 per cent of the amount that would have been received at the beginning of the month after the month in which the plan member reached age 65, that payments to a widow would be reduced 2-1/2 per cent for each year she was more than 10 years younger than her husband, and that dependents' allowances were based on a sliding scale according to age. In 1971(163) the sex discrimination in benefits was removed and spouses' benefits became available to widowers on the same terms as to widows. An amendment two years later defined dependent child as under 18 or under 25 when in school or university full-time. (164)

Disability Benefits

The 1917 legislation,(165) first introduced the provision allowing a full pension in cases of full disability after 15 years' service. There was no provision for partial disability until the amendments of 1930(166) which allowed benefits to be calculated at the full rate based on a maximum of 39 years' service, with a $240 annual minimum payment, plus $10 for each year over age 60. Full pension continued to be paid in cases of permanent disability after 15 years' service. In 1933(167) it was provided that application for full or partial disability pensions must be made within two years of cessation of employment. Any return to work after disability occasioned a termination of the pension and repayment of benefits to the fund. In 1946 the extra $10 payment provision was clarified to mean $10 for each year the recipient was over age 60 at the time of termination of employment.(168) When the Canada Pension Plan was introduced, disability benefits under the Teachers' Plan were integrated with it, and became payable after 10 rather than 15 years' service, as in the 1966 amendments.(169)

Fund Investments

The initial Act of 1917 provided for a fund to be the responsibility of the Treasurer of Ontario but laid down no rules for investment of funds. The following year an amendment to the School Laws(170) allowed for the transfer of monies from local or municipal funds in existence to the Teachers' and Inspectors' Superannuation Fund (particularly the Toronto and Ottawa funds) but rules for the handling of the fund were not forthcoming until the extensive provisions of the 1920 amendments.(171) Section 10 stipulated that contributions in each fiscal year ending October 31 were to be credited as of February 1 in each fiscal year, and interest was to be calculated half-yearly on April 30 and October 31 at rates of provincial loans as fixed by the Lieutenant-Governor in Council for the period February 1 to July 31 in each fiscal year. Any balance of contributions as of October 31, 1920 was to be set aside from Consolidated Revenues to constitute the fund. Funds could be invested in provincial securities; books were to be kept and an account set up in a Canadian chartered bank in the name of the Treasurer of Ontario. Auditors were required to report annually, with the costs of the audit to be borne by Consolidated Revenues. Actuarial valuations were to be made at least every three years. The next major revision occurred in 1932,(172) and outlined the provisions for investing the fund in debentures. Beginning on November 1, 1932 and on November 1 in each of the following nine years, the surplus in the fund was to be in the form of debentures bearing 4-3/4 per cent annual interest payable half-yearly and to mature on November 1, 1942. At November 1, 1942 any surplus was to be reinvested in 40-year debentures, at 4-3/4 per cent per annum as before. This 10-year/40-year arrangement was maintained for the period beginning in 1942. Amendments in 1946(173) provided that the interest rate for the 40-year debentures was to be the rate paid over the 10-year period immediately preceding, and that

debentures and stock were to be a charge on Consolidated Revenues. The amendments also confirmed that the fiscal year ended October 31 and that actuarial valuations were required triennially beginning July 1, 1948. Unless otherwise stated interest on payments into and out of the fund (other than benefits) was to be 4-3/4 per cent per annum compounded half-yearly on any payments not less than six months in arrears. The Act of 1949(174) provided that the interest rate on debentures maturing in 1952 should be lowered to 4-1/2 per cent, similarly for the 40-year debentures to be issued in 1952, for those maturing in 1962, and for the 40-year debentures to be issued in 1962. Any fund deficiency was to be made up from Consolidated Revenues, the next actuarial valuation was to be July 1, 1951, and the annual report had to be tabled in the legislature by the Treasurer. The following year the interest rate for the 10- and 40-year debentures was to be the rate approved by Lieutenant-Governor in Council and agreed to by the Treasurer and the Commission.(175) The 1953 amendments(176) stipulated that any credits to the fund were to be credited as of June 1 with interest at 4 per cent from date to the end of the fiscal year in which they were actually received. In 1955(177) provision was made for short-term (under 12 months) investment of the funds "in any securities in which the Treasurer may invest the public monies of Ontario." In 1966 the interest rate was raised to 5 per cent unless specified otherwise.(178) The amendments of 1971 allowed withdrawal of earlier issues of debentures maturing in 1942, 1952, 1962, and 1972 and their reissue with 6 per cent interest. Provision was also made to issue future debentures for not less than 20 and not more than 25 years, with interest to be the weighted average yield to maturity of long-term securities issued during the next preceding fiscal year.

Plan Administration

The original Commission's five members were to approve benefits and administer the plan; they consisted of one actuary and two other members appointed by the Minister of Education, one of them to be chairman for a three-year term, and two members elected by and from the membership of the Ontario Education Association. The amendments of 1919(179) stipulated that administrative costs were to be borne by the provincial Consolidated Revenues but in the following year, in concert with major legislation regulating the fund, as explained, this was revoked and all payments and administrative costs were to come from the fund.(180) In 1935(181) it was provided that the audit costs should come from the fund as well, rather than from Consolidated Revenues as had been the case. The 1938 amendments(182) expanded the Commission to seven, by allowing for one further appointment by the Minister, all appointees to serve for three years, and by increasing the elected membership to three, with the following provisions: three teachers or inspectors who were members of the Ontario Education Association and contributed to the fund were to be elected for three-year terms, one by and from the secondary school members in 1938, one by and from the public separate school male members in 1939 and one by and from the public separate school female members in

1940. In 1941(183) the amendments allowed future elected members to have similar staggered terms, and in 1943 the requirement that the elected be members of the OEA was dropped, although they still had to be contributors to the fund. In addition, the 1943 amendments provided for terms as follows:

- one member by and from the public and separate school female teachers and inspectors during April and May 1943;

- one by and from the secondary school teachers and inspectors during April and May 1944;

- one by and from the public and separate school male teachers and inspectors during April and May 1945;

and so on for each succeeding triennium. Vacancies were to be filled within six months.(184) The 1946 legislation(185) established dates when the Commission should meet, determined that five members constituted a quorum, and provided for the appointment of a Secretary by the Commission. The 1949 act(186) again expanded the Commission, with five members to be appointed by the Minister for terms of three years (the fifth to be appointed as of June 1, 1950) and four to be elected by and from contributors to the fund as follows:

- one by and from the Federation of Women Teachers' Associations of Ontario, for a three-year term commencing June 1, 1949;

- one by and from the Ontario English Catholic Teachers' Association and L'Association de l'enseignement francais de l'Ontario, for a three-year term commencing June 1, 1950;

- one by and from the Ontario Secondary School Teachers' Federation, for a three-year term commencing June 1, 1950;

- one by and from the Ontario Public School Men Teachers' Federation and male public school inspectors, for a three-year term commencing June 1, 1951.

Members became eligible for re-election or re-appointment. Six members constituted a quorum. In addition, provision was made for the appointment by Lieutenant-Governor in Council of a secretary, actuary, solicitor, medical referee, and other officers and staff thought necessary, with expenses to be paid from the fund. This situation continued until 1959(187) when the Commission was again expanded, to six members to be appointed by the Minister and five to be elected by teachers' organizations as designated in the regulations. Quorum was eight members. In 1966(188) the term "actuary" was defined as a Fellow of the Canadian Institute of Actuaries, and the secretary was supplanted by a "director" of the Commission. The current Commission remains at 11 members as described above.

ONTARIO MUNICIPAL EMPLOYEES RETIREMENT SYSTEM

Although the second largest public sector pension plan in terms of covered membership, the OMERS plan is of comparatively recent origin. The legislation governing it(189) was passed during the 1961-62 session, and employee and employer were defined as follows:

1. e) "employee" means any person who is employed by an employer but does not include any person who contributes to a pension plan under the Teachers' Superannuation Act, the Power Commission Insurance Act, or the Public Service Superannuation Act;

f) "employer" means a municipality or local board.

The legislation provided for a board to be set up to manage and administer the system, and to appoint a secretary-treasurer, auditor, actuary and such legally qualified medical practitioners, advisers, and employees as necessary. An annual report was to be provided to the Minister to be tabled in the legislature; an actuarial valuation was required at least every three years, and any surplus in the fund was to be transferred to the Treasurer of Ontario. The fund's investments were to be in the form of Ontario debentures maturing December 31, 1973 and bearing interest at the rate of 5 per cent payable half-yearly; at December 31, 1973 a 40-year issue was to be made bearing 5 per cent payable half-yearly, and further debentures issued for the next 10-year period, in the manner outlined for investments under the Teachers' Fund.

The major provisions of the OMERS plan are contained not in legislation but in regulations, and as a consequence the remaining provisions of the plan at inception were outlined in Regulation 168/62. It provided optional membership for employers, and coverage of full-time employees of participating employers where 75 per cent of the employees indicated the desire to join. Coverage was within one year of hire for new employees. Contribution rates depended on retirement age which was normally 65 except for police and firefighters who retired at 60; the rate was 5-1/2 per cent of earnings for those with normal retirement at 65, and 6-1/2 per cent for the others. Provision was made for prior service credits. The employer matched contributions on a varying rate depending on the requirements of the fund. The pension benefit was 2 per cent of contributory earnings multiplied by years of service, and payment began on the first day of the month after the month of retirement. For those terminating before normal retirement age a deferred pension of 2 per cent of contributory earnings was available, and actuarially-reduced pensions could be taken for early retirement up to 10 years before normal retirement age. Bridging provisions were available until age 70 when the Old Age Security became payable. In cases of retirement or death before pensionable age, contributions were returned with interest at 3 per cent compounded annually.

A disability pension, also at the rate of 2 per cent of contributory earnings, was payable in the case of persons with 10 years' service, but benefits were integrated with any payments from Workmen's Compensation to a maximum of 75 per cent of the monthly rate of earnings just prior to disability.

A surviving widow was entitled to a 50 per cent pension (1 per cent of contributory earnings) reduced by 2 per cent per year for each year the widow's age was below the member's normal retirement age. No benefit was provided for a widow who married the member after his 60th birthday or after the start of retirement. The benefit was payable to surviving children up to age 18 if the widow died or remarried, or if the wife had predeceased the member.

The terms of membership of the board were outlined: it was to comprise three officials of the province, two members of a local or municipal board, and four plan members, two of whom were to be municipal treasurers. Terms were for three years on a staggered basis - one-third of members to serve for three years, one-third for two years, and one-third for one year. Terms were to be served until members were replaced. Quorum was determined as a majority of members. The board elected its chairman and vice-chairman; the secretary-treasurer was appointed and was in charge of the fund.

The changes made since 1961 are outlined in the following sections.

Benefits

A regulation in 1965(190) amended the pension to provide a maximum of 2 per cent of contributory earnings multiplied by years of service less payments under any prior service plan or contributions with interest, still at 3 per cent. Later in the same year the benefit formula was expressed as the percentage of contributory earnings that bears the same ratio to 2 per cent as the percentage of earnings contributed bears to 5-1/2 per cent or 6-1/2 per cent, depending on normal retirement age.(191) The bridge with Old Age Security remained, on an optional basis.

The following year, reflecting the introduction of the Canada Pension Plan, the formula was amended to either 2 per cent of contributory earnings multiplied by years of service less .55 per cent (for those with a normal retirement age of 65) or .46 per cent (for those with normal retirement at 60) of earnings up to the YMPE for earnings since January 1, 1966, or the transferred-in benefits from another plan, whichever was greater.(192) A bridge payment of 2 per cent of contributory earnings until CPP became payable was introduced.

In 1968(193) the formula was enriched from 2 per cent to 2.2 per cent of contributory earnings after January 1, 1968, reduced for each year in the same proportion that the contributions of the member in that

year are reduced to 4 per cent if normal retirement age is 65 and to 5 per cent if normal retirement age is 60. The bridge for CPP payments incorporated the 2.2 per cent formula.

While the formula remained the same, an amendment in 1971(194) added 10 per cent of pension calculated on contributions before January 1, 1971, as an enrichment, and at the same time increased pensions in pay before that date by 10 per cent. The following year the calculation was again enhanced by an increase of 5 per cent of pension on earnings prior to January 1, 1972, and by a similar increase granted to pensions in pay before that date.(195) Similar increases of 5 per cent were granted effective January 1, 1973(196) and January 1, 1974(197); an increase of 10 per cent was instituted as of January 1, 1976.(198) In 1977 the benefit formula was simplified to 2 per cent of contributory earnings multiplied by years of service to a maximum of 35, less .7 per cent of contributions up to the YMPE. The plan changed from a career average to an average best formula, based on the best 60 months of continuous service. Finally, an increase of 3 per cent was made to the pension calculation and to pensions being paid in 1978.(199)

Employers may elect to provide supplementary benefits, upon entering into an agreement with the board. In addition, optional service is allowed, with back contributions as described in the following section. Benefits in such cases are determined in the agreement with the board, but in no cases may the total exceed the maximum established by the Municipal Act.

Eligibility

Membership continued to be based on the formula of 75 per cent of employees wishing to join; in 1964 a legislative amendment expanded coverage to include district assessors,(200) and in 1965 the "Power Commission Insurance Act" was deleted from the definition of employee.(201) A regulatory change in 1967(202) provided that coverage for those employed before July 1, 1968 was to be immediate; for those employed after that date a maximum waiting period of 12 months applied. In 1972 it was provided that part-time employees might be covered by agreement if the members warranted it,(203) and municipal councillors were included.(204) A legislative amendment in 1976(205) allowed optional service to be counted in the plan, and covered service in any municipal or local board in Canada, the civil service of Canada or any of the provinces, any board, or commission of Canada or the provinces. Also included was war service, which was defined as service in World War II or Korea in the navy, army, air force, Canadian, or British merchant marine or any ally designated by the Lieutenant-Governor in Council. An amendment in 1977 allowed for immediate coverage for continuous full-time employees hired on or after January 1, 1978.(206)

Contributions

The original rates of 5-1/2 per cent of earnings for those normally retiring at 65 and 6-1/2 per cent for the rest was amended in 1965(207) to recognize the CPP structure; from that time the rate was 4 per cent up to the YMPE and 5-1/2 per cent thereafter (normal retirement at 65) and 5 per cent up to the YMPE and 6-1/2 per cent thereafter (normal retirement at 60). At the time the benefit formula moved to an average best basis, the contributions were changed to 5-1/2 per cent to December 31, 1977 and 7 per cent thereafter less 1-1/2 per cent up to the YMPE (for normal retirement at age 65) and to 6-1/2 per cent to December 31, 1977 and 8 per cent thereafter (for normal retirement at age 60), also less 1-1/2 per cent up to the YMPE.(208) It was stated that the new rates did not override the terms of any collective agreement in existence, and in cases where the employees' contributions would fall short, the employer was to make up the difference until a new contract was agreed upon.

In 1966 a penalty of 1 per cent per month for late payment of employer contributions was imposed.(209) Allowance was made for prior service contributions with interest at the rate of Ontario debentures in the month of contribution. In 1976 the rates of contribution for optional service were set at 11 per cent for persons normally retiring at 65 and 13 per cent for persons with normal retirement at 60 (employer-employee share) plus interest at 6 per cent per annum.(210)

Vesting and Locking-in

The original provision for a deferred pension (immediate vesting) continued until the advent of the Pension Benefits Act. In 1965, with the statutory provision of age 45 and 10 years' service, contributions were locked in.(211) The interest payable in cases of refunds of contributions remained at 3 per cent until 1977 when it was set at 3 per cent to December 31 of that year and 5 per cent thereafter, compounded annually.(212)

Portability

At the time of its inception the OMERS plan recognized an added benefit of portability of pension credits: "It was felt that a large pension system allowing portability...would encourage employee mobility and thus help develop and increase the supply of experienced municipal employees."(213) Apart from portability between municipalities and local boards in Ontario, transferability to other bodies was soon incorporated. When transferability to public service plans was instituted in 1965, the benefit was the greater of contributions with interest or the present value of a retirement pension.(214) This system continued with provisions for optional service as outlined in the section on contributions, until an amendment in 1977 allowed for transfers to any fund permitting such transfers.(215)

Retirement Age

Since inception, the normal retirement age has been 65 for all employees except police and firefighters who may retire at 60. Actuarially reduced pensions are available for early retirement up to 10 years prior to normal age.

Survivor Benefits

The pension payable to a widow continued to be 50 per cent of the accrued benefit until 1966(216) when it was was reduced by 2-1/2 per cent for each year she was younger than the deceased member; children under 18 of a member (including a female plan member who was supporting them) received 50 per cent of the accrued benefit divided among them. In 1970,(217) a regulation extended benefits to dependent or disabled widowers of plan members, and children's benefits to those under age 21 if attending school or university full-time. In 1972 the restrictions on widowers were lifted and benefits became payable on the same terms as to widows; the children's benefit was increased by 10 per cent of the pension amount with a ceiling on the total increase of 25 per cent of the pension being paid.(218) Later in 1972 the increase was raised to 20 per cent, maintaining the ceiling of 25 per cent of pension.(219) Beginning in 1974(220) the provision that a widow had to marry the member before his 60th birthday was removed, but the marriage still had to take place before receipt of pension. Amendments in 1977(221) removed the education restricton on children's benefits which became payable up to age 21; survivor benefits were integrated with CPP provisions; the surviving spouse pension remained at 50 per cent of the actual or accrued pension of the deceased member, reduced by 2-1/2 per cent for every year the survivor was more than 10 years younger than the deceased. The child's benefit was increased by 20 per cent, to a total maximum of 50 per cent of the pension in pay. Provision was made for the recalculation of benefits in cases of early retirement before January 1, 1978 as if the retirement pension had not been reduced for early retirement.

Disability Benefits

The original provision of a disability pension after 10 years of service continued unchanged until 1966(222) when disability was required to be "total and permanent." This was defined as:

> "if found by the secretary-treasurer, on the advice of a legally qualified medical practitioner appointed by the Board to be incapable of engaging in gainful employment during the remainder of his lifetime because of mental or physical impairment of the member."

The pension was payable on the first of the month following the month of termination or approval of the claim, whichever came later. In cases where disability ceased the pension was suspended.

In 1975(223) it was provided that persons in receipt of disability pensions, Workmen's Compensation, or Unemployment Insurance benefits continued to be considered employees for purposes of contributions. The maximum pension from OMERS disability and Workmen's Compensation continued to be 75 per cent of monthly earnings prior to disability. In 1977 the definition of "totally disabled" was amended to read:(224)

> "wholly prevented due to mental or physical incapacity from performing the regular duties of the occupation in which such member was engaged immediately prior to such date, and such disability shall be considered to continue if the member is so prevented during the first twenty-four month period immediately after such date, and, thereafter, such disability shall be considered to continue if the member is wholly prevented from engaging in any occupation or performing any work for compensation or profit for which the executive-director, on the advice of a legally-qualified medical practitioner appointed by the Board, considers the member is or may become reasonably qualified by education, training, or experience."

Persons could not qualify for payment under this definition if they worked for pay somewhere other than in a rehabilitation program; if, in the case of mental illness, they were not confined for treatment after one year, if the injuries resulted from self-inflicted wounds; or if they were disabled before completion of one year's service. The pension continued to be calculated on the basis of the normal retirement pension, and was payable from the fifth month after declaration of disability. Disability and Workmen's Compensation benefits together could not exceed the monthly rate of earnings just prior to disablement. Retirement pension benefits continue to accrue during disability.

Fund Investments

The original provisions for funding whereby Ontario debentures bearing 5 per cent and maturing at the end of 1973 would be issued continued in force until 1968.(225) A legislative amendment in 1968 stipulated that the debentures issued after January 1, 1968 and maturing on December 31, 1977 should bear interest at 6-1/2 per cent per annum payable half-yearly. The same rate was to apply to the 40-year debentures issued to the year 2013. In 1970(226) it was provided that debentures issued to the end of 1969 should continue to fall due in 1973 and carry 6-1/2 per cent interest, but those issued from 1970 on should be for periods of not less than 20 and not more than 30 years, and carry interest at least as high as the weighted average of bonds issued each year. When the various debentures became due in 1973, authority was given for their reinvestment at varying rates of interest ranging from 5.49 per cent per annum payable half-yearly for those issued in 1963 to 8.19 per cent for those from 1969, and all were reinvested for a 30-year period.(227) In 1974, following the establishment of an investment policy committee of the board, it was provided that in future funds

could be invested in public markets subject only to the conditions of the Pension Benefits Act.(228)

Plan Administration

The original board of nine members continued until 1967, though in 1965 a legislative amendment had expanded their powers and authorized them to manage funds other than OMERS.(229) In 1967(230) the membership was expanded to comprise four officials of the province, two councillors of a participating municipality or local board, and five employees, of whom two were to be treasurers. All were appointed by Lieutenant-Governor in Council for up to three-year staggered terms so that four members held office for three years, three for two years, and four for one year. In 1970(231) the employee membership was expanded to five, two of whom were to be officers of their municipality or local board. In 1974(232) the provincial representation declined from three to two and the employees added a member, to a total of six, still with the requirement that two be officers of their municipality or local board. Terms were set at three years or less, until successors were appointed. Amendments of 1975(233) added the position of executive director and outlined the duties for the position, and determined that the board should forward its annual report to every participating employer and to employees on request. In 1976(234) the employee representation was raised to seven, two of whom were to be officers of their municipality or local board, while the province continued to have two members. The investment policy committee, established in 1974, continues.

HOSPITALS OF ONTARIO PENSION PLAN

When the plan was conceived in 1959 a majority of the 168 hospitals in Ontario did not have pension plans; those which did frequently provided inadequate benefits. It was therefore judged appropriate to set up an industry-wide plan that would ensure adequate benefits, provide for portability within the industry, obtain economies of scale in administration, and provide uniformity and stability in pension costs. The plan operates as a multi-employer plan.

The Hospitals of Ontario Pension Plan (HOOPP) plan was established on January 1, 1960. It provided to full-time employees a basic pension of 2 per cent of the accrued career earnings, with provision for past service based on an accrual rate of 1 per cent of 1959 earnings multiplied by years of service before 1960, less two years. Options at retirement included a five-year guarantee, 10-year guarantee, integration with Old Age Security (then payable only at age 70), or a 50 per cent joint survivorship option, all adjusted actuarially. Normal retirement age was 65, but voluntary early retirement was possible at age 55 or over after 10 years' service, with pensions reduced by 6 per cent for each year the retiree was below age 65. With the permission of the employer, retirement could be postponed beyond 65.

The plan was contributory, with employees paying 5 per cent of earnings and the employer paying one and one-half times that rate. Additional voluntary contributions were permitted. A disability benefit was available to employees age 55 and over with a minimum of 10 years' service with benefits reduced 3 per cent for each year of retirement before age 65.

Benefits vested after 10 years of service, and contributions earned interest of 3 per cent per annum. The normal death benefit was a return of contributions with interest less any benefits paid.

The plan comes under the authority of the Board of Directors of the Ontario Hospital Association which, at its inception, established a Pension Committee to administer the plan. The plan is trusteed and monies are invested on the open market. Outside pension consultants have also been retained since inception.

Features of the plan as they have evolved over the intervening years are outlined in the following sections.

Benefits

With the introduction of the Canada Pension Plan in January 1966 the HOOPP was amended to provide a benefit at normal retirement of 1.4 per cent of the average earnings up to the YMPE and 2 per cent thereafter. The past service benefit for service prior to January 1, 1960 remained unchanged. In 1968 the plan was changed from a career average to a final average basis, dependent on the 15 consecutive years with the highest annual average earnings. The basic calculation then moved to 2 per cent of final average earnings for each year of service between 1960 and 1965 inclusive, and 1.4 per cent to the YMPE and 2 per cent thereafter for each year of service after 1965. Benefits for service before January 1, 1960, for employees terminating on or after January 1, 1968, increased to 1-1/2 per cent of 1959 earnings.

In 1971 the basis of calculation was reduced from the best 15 consecutive years' service to the best 11 years, using the best 11-year average as the average YMPE. In 1974 the average period for YMPE average was reduced to the three years preceding death or retirement, and the average earnings basis reduced from 11 to five consecutive years.

In April of 1979 ad hoc increases to pensioners who retired before 1979 averaged 22 per cent of pension.

Eligibility

The plan is open to full-time permanent employees who may elect to join after six months' service but who must join after two years' service.

Contributions

Integration with the Canada Pension Plan in 1966 set employee contributions at 3.5 per cent up to the YMPE and 5 per cent thereafter, or 5 per cent for those not contributing to CPP. In 1974 the rate increased to 4.5 per cent up to the YMPE and 6 per cent thereafter.

Employer contributions, at one and one-half the employees' rate measured 7.5 per cent of payroll in the first 18 months of operation. Effective January 1, 1966 this was amended to 1.7 times the employee rate.

Vesting and Locking-in

With the enactment of the Pension Benefits Act in 1965 an optional deferred pension was provided for employees under age 45 with 10 years' service; otherwise, the mandated locking-in applied. Terminated employees who elected a refund of contributions and after a break of six months, are employed with another hospital, are treated as new employees.

In 1971 an amendment provided that refunds on contributions made before December 31, 1970 earned 3 per cent per annum, while contributions after that date earned 5 per cent compounded annually.

Voluntary contributions are also refundable, with interest based on the rate of return on investments: 5.25 per cent in 1968-1972; 6 per cent in 1973; 7.5 per cent in 1974; and 9 per cent in 1975.

Portability

Service credits are fully portable between member hospitals provided the break in service is less than six months. Reciprocal agreements exist with the federal and Ontario governments and their agencies, and with the following bodies; Toronto Western Hospital, the Hospital for Sick Children, the Ontario Cancer Institute, McMaster University Medical Centre, the Workmen's Compensation Board, and the Colleges of Applied Arts and Technology.

Retirement Age

Normal retirement age remains 65, but provision is made for contributions and service to continue to age 70, at which time benefits must be paid.

In 1974 unreduced benefits were allowed for employees aged 62 with 20 years of service. Early retirement is also permitted for employees aged 55 or more with 10 or more years of service, with pension based on accrued benefits to normal retirement reduced by .5 per cent for each month by which retirement precedes age 65.

Survivor Benefits

In 1968 the optional joint and survivorship pension was superseded by a survivor's and orphan's pension that provided 50 per cent continuation of the accrued pension benefits at date of death to a widow or disabled, dependent widower. If no widow or disabled widower existed the 50 per cent benefit was payable to orphans up to age 18, or 21 if in school or university full-time. The structure of payments was altered to provide three optional forms of payment: an immediate life annuity with or without a guaranteed period (to a 15-year maximum); instalments over a maximum of 10 years; or a lump sum. In 1976 benefits to surviving spouses of female plan members were made the same as for the spouses of males.

Disability Benefits

In 1968 the plan was amended to allow for the accrual of pension benefits during receipt of disability benefits from the Hospitals of Ontario Disability Income Plan. In 1974 this provision was repealed, thereby allowing employees over age 55 with 10 or more years service to receive pension benefits as well as the disability payments if they elected to retire. The former maximum salary for contributions while on disability leave was rescinded.

The pension itself was modified in 1974 to allow for reduction of benefits from age 62 rather than 65. It was available to members age 45 and over rather than 55.

Fund Investments

The two original trustees of the fund administered the investments in approximately equal amounts. At the end of the first 18 months the fund amounted to $8,744,878, and earnings net of trustees' expenses amounted to 4.96 per cent per annnum.

At the end of the fifth year of operation (June 30, 1965) the fund amounted to $46,243,854, and earned 5.08 per cent net of trustees' expenses. By 1970 a third trustee had been engaged - with a trust company acting as custodian for the new trustee's share of the fund. Investments continued to be administered in approximately equal amounts. At the end of 1970 (the plan fiscal year end now being December 31) the fund totalled $133,962,493, and earned 2.89 per cent net of trustees' expenses, compared with 4.16 per cent for 1969.

Effective January 1, 1976 National Trust became sole trustee for the fund which, at December 31, 1975 stood at $369 million. However, investment responsibility remained in three parts - National Trust, Toronto Investment Management Incorporated, and the Investment Section of the Ontario Hospital Association.

At the end of 1978 the fund had expanded to $758 million with overall yield for the year at 11.8 per cent. The four-year average yield stood at 12.8 per cent.

Plan Administration

The original Pension Committee consisted of a chairman, vice-chairman, secretary, and four other members. By 1965 the position of vice-chairman had been dropped but total membership remained at seven. Five years later the committee had grown to twelve members, and at present stands at fourteen, as follows: seven chief executive officers, five trustees of hospitals, and two representatives of the Ministry of Health.

Detailed administration is carried out by the Pension and Group Life Services Staff of the Ontario Hospital Association under the direction of the Pension Committee.

ONTARIO HYDRO

Provisions of the original pension plan and most subsequent amendments were made by Order-in-Council rather than by legislation. Since regulations in Ontario were not consolidated until 1950, details of the earlier provisions are not easily determined. Therefore the information concerning early years is subject to errors and omissions, though the broad outlines are sufficient to establish the trends in the plan provisions.

An amendment to The Power Commission Act in 1919(235) added the authority to provide

> "....for the payment to permanent employees of the Commission, of superannuation and retiring allowances, or of a gratuity or annual allowance to the dependents of employees dying while in the service of the Commission, and a fund for providing sick benefits for permanent employees, and....provide for contributions to such fund by the Commission and by its employees, or for the establishment and support of such fund entirely at the cost of the Commission."

Municipal employees of power commissions could also be included in any such scheme.

It was not until 1923 that such a plan came into existence when Order-in-Council of October 29 established the effective date of the plan as November 1, 1923 and set the following provisions:

- the plan covered all permanent employees as of the effective date; new permanent employees under age 30 could join subject to

a medical examination and those over 30 could join at the option of the Commission;

- the plan was contributory, with members joining on November 1, 1923 paying 3 per cent, and those joining after that date paying according to a sliding scale based on age at entry to the plan; (236)

- retirement age was 65 for all members;

- early retirement pensions were available in cases where management requested the retirement, and were based on 20 years' service and age 60 for men, 50 for women, with no actuarial reduction;

- postponed retirement was available by agreement between the Commission and the employee; contributions continued and benefits accrued;

- disability benefits that were available to employees with 10 years of service, at the Board's option, were the actual retirement benefit accrued without actuarial reduction. Benefits were to be integrated with Workmen's Compensation payments where applicable;

- the pension formula was one-eightieth of the average salary in the highest five consecutive years multiplied by service, with a minimum pension of $365 per year;

- in cases of death prior to retirement, payment to the estate was 5 per cent of current annual salary multiplied by years of service plus one year's current salary, the total not to exceed twice the current salary. For death after retirement, the payment was the difference between pension already paid and the amount that would have been payable had death occurred prior to retirement;

- upon termination of employment for reasons other than retirement or disability, contributions were returned with credited interest at 4 per cent compounded annually;

- leave of absence was provided to seasonal employees and those entering military service; contributions remained in the fund and a right to benefits was maintained.

Changes in the plan provision since its inception are outlined in the following sections.

Benefits

By Order-in-Council in 1926(237) the benefit formula remained the same, but the minimum pension of $365 per year was applied only to those employed as of November 1, 1923 and those under age 30 who joined later; no minimum was provided for new members over age 30 joining after that date. In 1938(238) the formula was increased to one-seventieth times the average salary for the highest five consecutive years, and the minimum pension was raised to $500 per year for employees at November 1, 1923 and persons under age 30 joining afterwards. Beginning in 1940(239) the plan moved to a career average basis and the minimum pension continued at $500 unless the career average was less than $1,000, in which case the minimum was to be 50 per cent of that amount. A minimum period of 20 years' contributory service was established to qualify for a pension. An amendment on November 1, 1947 changed the formula to 1-1/2 per cent of annual salary to August 1, 1947 multiplied by the years of contributory service to November 1, 1948. A year later it was again changed, becoming 1-1/2 per cent of base annual earnings (excluding such payments as overtime or isolation allowances) as of August 31, 1948 multiplied by the years of service to November 1, 1948 (known as the "effective date" of the plan for future amendments). The formula for service after this effective date was 2 per cent of total career earnings to the date of retirement. The plan had a five-year guarantee feature, as well as a single life annuity or contingent annuity option.

An amendment by way of regulation,(240) effective October 1, 1951 changed the formula to 1.5 per cent of maximum base annual earnings during the five-year period immediately preceding September 1, 1948 multiplied by established service, plus 2 per cent of earnings in respect of which contributions have been made after the "effective date" (November 1, 1948). In cases of normal retirement before November 1, 1953 the pension was not to be less than the amount that would be payable under the new fund. For regular employees, "service" included 50 per cent of their employment period from January 1, 1930 to the date of last being employed or age 45, whichever is later. The next amendment came in 1958(241) and applied to persons retiring at their normal retirement date on or after January 1, 1957. Established service for purposes of calculation was service before that date. The benefit formula was as follows:

- 1.5 per cent of average base annual earnings at July 1, 1955 and July 1, 1956 muliplied by service to October 31, 1948, plus

- 2 per cent average earnings at July 1, 1955 and July 1, 1956 multiplied by service from November 1, 1948 to December 31, 1956 or to normal retirement if earlier, plus

- 2 per cent of "premium earnings" from November 1, 1948 to December 31, 1957 (being the excess of earnings over base earnings for the months of November and December 1948 and the excess of

earnings over base annual earnings at July 1 in each year 1949 to 1956 inclusive and the excess of earnings over base earnings for 1957), plus

- 2 per cent of base contributory earnings from January 1, 1957 to the normal retirement date.

The total pension in this case should not be less than that produced under the old calculation method. In 1962(242) the formula was again amended for those retiring on or after January 1, 1962:

- 1.5 per cent of the average base earnings in the highest consecutive 60-month period multiplied by service to October 31, 1948, plus

- 2 per cent of "premium earnings" from November 1, 1948 to December 31, 1957, plus

- 2 per cent of the averge base earnings in the highest consecutive 60-month period multiplied by the sum of

  a) established service from November 1, 1948 to January 1, 1957,

  b) contributory employment thereafter,

  c) in the case of Continuing Construction Employees (temporary) the period after January 1, 1957 during which they contributed at the rate of 5 per cent and half the period after January 1, 1957 when they contributed at 2-1/2 per cent.

The total in cases (a) and (b) was not to exceed 70 per cent of the average base earnings in the highest consecutive 60-month period. A further regulation in 1965(243) maintained the benefit formula as the highest 60-month average but provided that in the light of the newly-formed CPP, pensions should be reduced by .7 per cent on earnings up to the YMPE for service after January 1, 1966. In 1967(244) the provision was amended to allow for a reduction of .625 per cent on earnings up to the YMPE after January 1, 1966 but stated that no reduction should be made until the pension became payable. In 1971(245) the formula was simplified to one of

- 2 per cent of the average base earnings in the highest 60 consecutive months (to a maximum of 70 per cent of best earnings) plus

- 2 per cent of premium earnings between November 1, 1948 and December 31, 1957, minus

- .625 per cent multiplied by earnings up to the YMPE after December 31, 1965.

Several improvements to pensions already being paid have been made since the beginning of the current plan in 1948. On January 1, 1957 an increase of 50 per cent was made to pensions of members who retired before November 1, 1947, and an increase of 15 per cent to pensions of those retiring between October 31, 1947 and January 1, 1957.(246) In 1967(247) an increase of $1 per month for each year of service to a maximum of 25 was granted to pensioners who retired prior to January 1, 1962, and in 1968(248) it was provided that contingent annuitant payments should reflect the maximum pension available. A further increase granted in 1971(249) increased pensions (including widows, disabled widowers, children, and contingent annuitants) by 2 per cent for each year of retirement and an additional 1 per cent for each retirement year before 1962. In 1973(250) a further increase of 2 per cent for pensions where payment began in 1971 and 4 per cent for 1970 and earlier was made to all retirement survivor and contingent annuitant pensions. This increase applied notwithstanding the existence of a bridging benefit for OAS or CPP. As of January 1, 1974(251) pensions which began in 1973 were increased by 4 per cent and those commencing in 1972 and before increased 8 per cent, the increases applying notwithstanding any bridge benefit. A further increase a year later(252) raised pensions by 8 per cent where the member retired or died while employed before January 1, 1974. This increase was prorated where retirement or death while employed occurred during the calendar year 1974. Again on January 1, 1977(253) an 8 per cent increase was made where the member retired or died in employment before January 1, 1975, and a pro rata benefit was paid for members retiring or dying while employed during 1975 and 1976, based on the number of months' pension paid in those two years. The latest increase of 8 per cent occurred on January 1, 1979,(254) for members who retired or died during employment prior to January 1, 1977, and was prorated, based on the number of months of pension payment in 1977 and 1978 where the member retired or died while employed in that time.

Eligibility

An Order-in-Council in 1926(255) which extended membership to permanent employees up to age 45 who joined after November 1, 1923, also required a medical examination. The plan which came into effect on November 1, 1948 applied to all regular employees and all members of the Pension Fund and the Savings and Retirement Fund. Employees electing not to join received a refund of past contributions with interest at 3 per cent compounded annually. The medical requirement was revoked except for employees who had previously decided not to join and subsequently sought membership. An amendment to The Power Commission Act in 1949(256) defined "employee" as someone employed by the Commission on or after November 1, 1947, and made provision for the protection of pension credits of employees of some bodies previously under the jurisdiction of

the Commission. In 1960(257) "continuing construction employees," meaning temporary employees under age 55 in the case of men and 50 in the case of women and employed for five consecutive years at a minimum of 75 per cent of normal working hours, were permitted to join, and monies already contributed to the Savings and Insurance Plan were transferred to the pension plan. Service for these members was counted at 50 per cent of the time they were contributing at 2-1/2 per cent of earnings (to the Savings and Insurance Plan) and 100 per cent of the time they were contributing at 5 per cent (to the pension plan). In 1967(258) a regulatory change reintroduced the requirement for a medical examination in the case of new employees. Temporary employees who were members of the Office and Professional Employees International Union (OPEIU) became eligible to join on July 1, 1967 or one year after hire, whichever was later, and providing they had been employed without interruption. In 1968(259) a legislative amendment redefined "employee" as someone who had contributed and had been employed on or after November 3, 1947. Beginning in 1971(260) membership was made compulsory for new regular employees. An employee for whom OPEIU was the bargaining agent was covered after six months if employment had been substantially without interruption.

Contributions

While the original legislative authority for the plan allowed it to be non-contributory, in fact employee contributions have been a feature since inception. The record of any changes in rate between 1923 when the plan went into effect and 1950 when regulations were first consolidated is blank, but we find that by 1950(261) contributions, made by payroll deduction, were set at 5 per cent for all employees. With the advent of the Canada Pension Plan in 1965, contributions were integrated beginning on January 1, 1966(262) and set at 3.416 per cent up to the YMPE and 5 per cent thereafter. In 1967(263) the percentage payable up to the YMPE was raised slightly to 3.4375 per cent, a level that remains in effect currently.

The regulation of 1950(264) relating to the plan established on November 1, 1948 allowed for back payment of contributions, with interest at 3 per cent compounded annually in cases of re-employment although service benefits did not accrue for the time absent. In 1967(265) the time within which a re-employed person might elect to make back payments was set at a year. In 1971(266) the rate of interest on repayments was set at 4-1/2 per cent from the date contributions were withdrawn from the fund. In January 1979(267) provision was made for anyone who made any permissable withdrawal from the fund and who is rehired within one year to repay the amount withdrawn at current rates of interest.

The leave of absence provisions in the original plan were qualified in 1926(268) so that to maintain credits during any leave over one month the member had to make contributions plus 5 per cent for the

employer portion. The 1948(269) plan provided that if the employee was on leave without pay no contribution could be made; if on leave with pay then contributions continued. However it was provided that persons on leave without pay who received Workmen's Compensation should have those payments, or any payments equivalent to earnings, count as earnings. An amendment by regulation in 1967(270) provided that while on leave of absence with pay, contributions should continue; on leave of absence without pay for non-medical reasons, no contributions would be made nor credits accrue, but back payment might be made upon termination of the leave. In cases of medical leave the member had the choice of making up contributions. In 1975,(271) following the introduction of a long-term disability plan, it was provided that pension benfits should accrue during such disability with no employee contribution required.

The legislation of 1949(272) set the employer contributions as the difference between employee contributions and the cost of benefits; the same terms apply currently.

Vesting and Locking-in

Vesting as a concept was not featured in the plan until 1948. The original provision for a return of contributions in the 1923 plan was amended by Order-in-Council in 1926(273) to allow the 4 per cent interest to be compounded semi-annually. This amendment remained in force until the introduction of the new plan in November 1948. Regulations(274) then provided that employees terminating with at least 15 years' service who were within 10 years of their normal retirement date could receive a deferred pension at normal retirement of the benefits accrued to the date of termination. Otherwise, contributions were returned with interest, at the rate of 3 per cent compounded annually on contributions to the current fund, and at 4 per cent compounded semi-annually on contributions to the superseded pension fund, and 3 per cent compounded semi-annually to the superseded retirement fund. An amendment to the vesting provision in 1955(275) allowed a deferred pension to employees with 10 years' service. The pension payable at the normal retirement date was 50 per cent of the accrued pension to date of termination plus 10 per cent of the accrued pension for each additional year of service in the five years immediately following the 10 years of service, at the rate of 1.5 per cent of earnings. Otherwise, contributions were returned with interest as outlined.

Following the introduction of the Pension Benefits Act effective 1965 which mandated the 45 and 10 vesting rule, the vesting provision of the Hydro plan for persons meeting these criteria took three forms:(276)

a) a refund of contributions made before 1965 with credited interest, and vesting of all benefits earned after January 1, 1965;

b) a refund of contributions made before 1965 with credited interest and a refund of 25 per cent of the commuted value of

credits earned after January 1, 1965, the remaining 75 per cent being vested;

c) a deferred pension of 50 per cent of credits earned to January 1, 1965 plus 10 per cent for each year of service over 10 (as described above) plus 100 per cent vested benefits for service after January 1, 1965.

For those with more than 10 years of service but under age 45 the options were as described in the 1955 provision - a 50 per cent pension plus 10 per cent for each year of service over 10 or a refund of contributions with credited interest. For those with less than 10 years' service, contributions were refunded with credited interest. Changes effective at the beginning of 1966(277) allowed for immediate vesting as an option after one year of service. The provisions were:

- for those with less than one year's service, a refund of contributions with credited interest;

- for those with more than one year's service, a refund of contributions with credited interest or 100 per cent vested benefit;

- for those with 10 years' service but under age 45, a refund of contributions with credited interest or 100 per cent vested benefit or 75 per cent vested benefit and a refund of 25 per cent of the commuted value of the pension;

- for those with 10 years' service over age 45, 100 per cent vested benefit or 75 per cent vested benefit and a refund of 25 per cent of the commuted value of the pension or a refund of contributions made before January 1, 1965 with credited interest and 75 per cent vesting of credits earned after that date and a refund of 25 per cent of their commuted value.

Effective January 1, 1970(278) the interest on the current fund was raised to 4-1/2 per cent compounded annually (the superseded funds remaining at 4 per cent and 3 per cent respectively) and to 6 per cent compounded annually from January 1, 1979.(279)

Portability

While the legislative authority for the plan, in 1919, allowed municipal employees to be covered, no formal transferability was featured in the plan until 1961.(280) Effective July 1, 1961 employees with five years' service transferring between Ontario Hydro and any municipality whose pension plan allowed for reciprocal agreements could use credits from both plans for the eventual pension. The following year the provision was amended so that employees transferring to a municipality before January 1, 1962 (when death benefits were amended) came under the old provisions. Employees who transferred after December 31, 1961 and

died while serving the municipality have a refund of contributions plus interest made to their beneficiary or estate. A regulatory amendment effective January 1, 1966(281) provided that employees transferring prior to that date would be covered under the provisions in force when the transfer was made; those transferring after December 31, 1965 must have contributed to the plan for one year to qualify. In 1971(282) provision was made for vested members who died while serving the municipality after July 1, 1970 to receive Ontario Hydro death benefits. Those vested before January 1, 1962 and who died while in the employ of a municipality had their service credits with the municipality to July 1, 1970 included for the calculation of death benefits under the pre-1962 conditions if a widow's or child's benefit was not payable.

In 1973(283) Ontario Hydro was permitted to enter into reciprocal transfer agreements with other employers, and to date has signed three such agreements: the Province of Ontario (1972), the Government of Canada(1972); and the Province of New Brunswick(1975). The following qualifications apply as of the date of the agreement:

- termination of employment with one of the employers must have been after the date of the agreement and re-employment must be within three months;

- no refund of contributions can have been received;

- must be eligible for membership in the new employer's plan;

- the request for transfer must be made within six months of the agreement or one year of joining the new plan, whichever is later;

- the first employer must then be released from any pension obligation.

Retirement Age

The normal retirement age of 65 has remained consistent for male employees throughout the life of the plan. For women, the age was set at 60 when the 1948 amendments took effect,(284) and women who were at least 60 years old on November 1, 1948 retired on that date. In 1965(285) it was stipulated that the age would be raised to 65 except for current OHEU members. In 1967(286) women could elect normal retirement between 60 and 65. In 1971(287) it was provided that males age 63 with 25 years' service could retire on full accrued pension. As of January 1, 1976(288) the age was set at 65 except for female employees hired before that date who could still retire at 60.

While the original plan had allowed for early retirement when requested by management, the amendment of 1926(289) allowed the board to reduce the service requirement from 20 to 10 years in such cases. In

1940(290) the provision changed to allow women at age 60 with 20 years' service to retire on an unreduced pension at the option of management. A reduced pension was available to women from age 50 with 20 years' service; for men the age was 55. When the 1948(291) plan came into effect male and female employees who were within 10 years of normal retirement and who had 15 years' service could retire on an actuarially reduced pension. Beginning in 1962(292) the reduction in pensions was changed from an actuarial basis to one of 2 per cent for each of the first five years below normal retirement and 3 per cent for each of the following five years, parts of years being calculated on a proportionate basis. The 1971(293) amendment allowing male members to retire at 63 with 25 years' service did so on an undiscounted basis. In addition, vested members terminating after December 31, 1970 and subsequently requesting early retirement would, upon approval of the application, be subject to a full actuarial reduction. The 2 per cent/3 per cent reduction formula continued in force for employees with 15 years of service who were within 10 years of normal retirement. However, in 1976(294) employees with 25 years' service could retire at age 60 without a reduction in pensions. The reduction betwen ages 55 and 59 was on a sliding scale from 3 per cent at 59 to 25 per cent at age 56.

Beginning in 1959(295) a bridging benefit to allow for pre-payment of benefits equal to Old Age Security in cases of early retirement was available; pensions were then reduced by $55 per month from age 70 to compensate for the pre-payment. In 1962(296) the reduction of pensions increased to $65 per month to match increases in the OAS payments, and to $75 in 1964.(297) Beginning in 1965(298) a bridge benefit was allowed for Canada Pension Plan benefits as well as OAS.

The 1948 plan provisions allowed for a postponement of retirement, if requested by the Commission. In such cases, no further contributions were required, and the pension commenced on the later retirement date.

Survivor Benefits

The formula for death benefits before retirement was amended by Order-in-Council in 1926(299) to provide for the payment of 5 per cent of the five-year highest average salary (or current year's salary if higher) multiplied by years of service plus the five-year average salary (or current year's if higher) to a maximum of twice the average or current salary. If death benefits were also available from Workmen's Compensation the total payment was not to exceed the maximum payment or one-third the amount payable under the Pension Regulations, whichever was greater. The 1948 plan(300) allowed for a return of contributions, to a beneficiary or the estate, with interest at 3 per cent. If the beneficiary was a spouse, child under 21, or certain other dependent relatives, the benefit was paid in minimum $50 instalments for 10 years, with interest.

A further amendment in 1957(301) allowed, in cases where an employee had at least 18 years of service, a payment to a beneficiary or the estate of contributions plus interest and a pension of 50 per cent of accrued benefits for service over 18 years on a month for month basis for a maximum of 60 months. In 1962(302) the provision was amended to provide for a return of contributions with interest for members with less than 10 years' service, and for those with more than 10 years who died before normal retirement, early retirement, or disability, either:

- 50 per cent of accrued benefits to the widow for life or until remarriage; or

- 50 per cent of accrued benefits to dependent children or orphans until the youngest reaches age 18 if there is no widow; or

- 50 per cent of accrued benefits to the dependent childen of female members until the youngest reaches age 18; or

- a return of contributions with interest.

The 50 per cent pension in all cases was not to be less than the contributions with credited interest. An amendment effective January 1, 1966(303) extended the surviving spouse pension to disabled, dependent widowers of female plan members, and to children to the age of 25 if in school full-time. Provision was made in a 1974 amendment(304) that where a widow's or disabled widower's pension was terminated because of remarriage and the second marriage ends for reasons other than the death of the former recipient, the pension may be reinstated. However, only one survivor pension may be received from the plan. In 1976(305) changes were made so that widowers no longer had to be disabled and dependent to draw benefits; common-law marriages were recognized. Where there were two surviving spouses, the member's designation of beneficiary was to prevail. Benefits continued to be 50 per cent of the accrued pension. In 1979(306) it was provided that a surviving spouse who had received a refund of contributions could, upon becoming eligible again for the benefit, have it reinstated by repaying the refund with interest.

The original provision from the 1923 plan, in cases of death after retirement, was to pay the difference between the pension payments actually received and the amount that would have been payable had death occurred before retirement. This prevailed until the new plan in 1948(307) which provided the balance of the 60-month guarantee to a beneficiary, or the contingent annuitant pension if selected. In 1957(308) it was provided that the benefit guarantee also applied to persons who had reached normal retirement age but had not retired. The 1966 changes expanded the benefits for members with 10 years' service or those retiring after December 31, 1965 to provide either:

- 50 per cent of pension to a widow who married the member before retirement; or

- 50 per cent of pension to a disabled dependent widower; or

- 50 per cent of pension to dependent childen until the youngest reaches age 18; if in school full-time the pension was payable to age 25; or

- 50 per cent of pension to any disabled childen until 25; or

- to a beneficiary.

The widow's pension was reduced by 2-1/2 per cent for each year the widow was more than 10 years younger than the member. If no survivor benefit was payable, the five-year guarantee applied with benefits to the estate. In all cases the payment must be at least the contributions plus credited interest. An amendment in 1967(309) provided survivor benefits, at the rate of 25 per cent of pension, for the widow, disabled widower, and children of any member who had retired before January 1, 1966 but died on or after October 1, 1967. In this case, too, the widow had to marry the pensioner before retirement began. In 1974(310) the conditions governing reinstatement of pensions terminated because of remarriage (as described for death benefits prior to retirement) applied to benefits on death after retirement, as did the 1979(311) conditions for repayment and reinstatement.

Disability Benefits

Payment of accrued benefits without actuarial reduction for persons with 10 years of service continued unchanged until 1940 except for the deletion, in 1938,(312) of the feature requiring integration of benefits with Workmen's Compensation. In 1940(313) the service requirement was increased to 15 years, but with the inception of the amended plan in 1948 no provision was made for disability benefits. Beginning in 1958(314) the provision was reintroduced for persons with 10 years' service, who received full accrued credits to the date of disability. The contingent annuitant option was not available to those in receipt of disability pensions. With the introduction of the CPP, disability benefits under the Hydro plan were subject to integration where applicable.(315) In 1976(316) a long-term disability plan was introduced, and as a consequence the disability provisions of the pension plan applied only to those employees not eligible for LTD coverage, such as those already declared disabled before April 1, 1975 and Continuing Construction Employees with 10 years' service. (The LTD plan paid 60 per cent of base earnings or 70 per cent of base earnings less CPP or Workmen's Compensation benefits, whichever is the lesser.) Pension benefits accrue during disability.

Fund Investments

The authority to establish a fund, outlined in the 1919 legislation,(317) did not set out how the monies were to be invested. Since regulations from the early years are missing we are without these details. However, we know from the amendments to legislation in 1949(318) that two funds - pension and retirement - were established. Effective November 1, 1948 the two former funds were replaced by a new pension fund to which the monies were transferred. By regulation in 1950(319) it was provided that an actuarial valuation must be carried out at least every five years. In 1967(320) that requirement was amended to the current three year interval. A legislative provision in 1960(321) allowed monies in the fund to be invested as authorized for joint stock insurance companies under the Corporations Act.(322) In 1965(323) this provision was widened to allow investment in anything authorized by the Pension Benefits Act. Hydro continues to invest in the open market.

Plan Administration

The plan is administered by the employer. A finance committee, composed of the chairman, vice-chairman, and three members of the board of directors and the President of Ontario Hydro are responsible for the overall investment policies.

NOTES

(1) The Ontario Public Service Superannuation Act, S.O. 1920, 10-11 George V, c. 4.

(2) The Ontario Public Service Superannuation Act, S.O. 1924, 14 George V, c. 7.

(3) The scale of contribution rates was as follows:

Under age 21	-	2-1/2 per cent
21 but less than 26	-	2-3/4 per cent
26 but less than 29	-	3-per cent
29 but less than 32	-	3-1/4 per cent
32 but less than 35	-	3-1/2 per cent
35 but less than 37	-	3-3/4 per cent
37 but less than 39	-	4-per cent
39 but less than 41	-	4-1/4 per cent
41 but less than 43	-	4-1/2 per cent
43 but less than 45	-	4-3/4 per cent
45 and over	-	5 per cent

(4) The Public Service Act, S.O. 1947, c. 89.

(5) The Public Service Amendment Act, S.O. 1948, c. 74.

(6) The Public Service Superannuation Amendment Act, S.O. 1960-61, c. 84.

(7) The Public Service Superannuation Amendment Act, S.O. 1961-62, c. 122.

(8) The Public Service Superannuation Amendment Act, S.O. 1966, c. 131.

(9) The Public Service Superannuation Amendment Act, S.O. 1975, c. 73.

(10) The Public Service Act, S.O. 1935, 25 George V, c. 58.

(11) The Public Service Act, S.O. 1947, c. 89.

(12) The Public Service Amendment Act, S.O. 1952-53, c. 91.

(13) The Public Service Amendment Act, S.O. 1955, c. 68.

(14) The Public Service Amendment Act, S.O. 1958, c. 89.

(15) The Ontario Public Service Superannuation Act, S.O. 1924, 14 George V, c. 7.

(16) The Public Service Amendment Act, S.O. 1933, 23 George V, c. 52.

(17) The Public Service Amendment Act, S.O. 1937, 1 George VI, c. 72.

(18) The Public Service Amendment Act, S.O. 1941, 5 George VI, c. 46.

(19) The Public Service Amendment Act, S.O. 1948, c. 74

(20) The Public Service Amendment Act, S.O. 1952-53, c. 91.

(21) The Public Service Amendment Act, S.O. 1955, c. 68.

(22) The Public Service Superannuation Amendment Act, S.O. 1960-61, c. 122.

(23) The Public Service Superannuation Amendment Act, S.O. 1971, First Session, c. 40.

(24) The Public Service Amendment Act, S.O. 1936, 1 Edward VIII, c. 56.

(25) The Public Service Amendment Act, S.O. 1948, c. 74.

(26) The Public Service Amendment Act, S.O. 1957, c. 102.

(27) The Public Service Superannuation Amendment Act, S.O. 1974, c. 37.

(28) The Public Service Amendment Act, S.O. 1931, 21 George V, c. 6.

(29) The Public Service Superannuation Amendment Act, S.O. 1965, c. 111.

(30) The Public Service Superannuation Amendment Act, S.O. 1966, c. 131.

(31) The Public Service Amendment Act, S.O. 1946, c. 83.

(32) The Public Service Amendment Act, S.O. 1947, c. 89.

(33) The Public Service Amendment Act, S.O. 1956, c. 74.

(34) The Public Service Amendment Act, S.O. 1957, c. 102.

(35) The Public Service Superannuation Amendment Act, S.O. 1964, c. 96.

(36) The Public Service Superannuation Amendment Act, S.O. 1971, Second Session, c. 10.

(37) The Public Service Superannuation Amendment Act, S.O. 1974, c. 37.

(38) The Public Service Superannuation Act, S.O. 1975, c. 73.

(39) The Public Service Amendment Act, S.O. 1933, 23 George V, c. 52.

(40) S.O. 1947, c. 89.

(41) S.O. 1951-52, c. 88.

(42) The Public Service Amendment Act, S.O. 1958, c. 89.

(43) The Public Service Superannuation Amendment Act, S.O. 1960-61, c. 84.

(44) As a result of the requirements of the Pension Benefits Act.

(45) The Public Service Superannuation Amendment Act, S.O. 1966, c. 131.

(46) The Public Service Superannuation Amendment Act, S.O. 1975, c. 73.

(47) The Public Service Act, S.O. 1927, 17 George V, c. 6.

(48) The Public Service Amendment Act, S.O. 1937, 1 George VI, c. 72.

(49) The Public Service Amendment Act, S.O. 1941, 5 George VI, c. 46.

(50) The Public Service Amendment Act, S.O. 1948, c. 74.

(51) The Public Service Amendment Act, S.O. 1952-53, c. 91.

(52) The Public Service Superannuation Act, S.O. 1960, c. 98.

(53) The Public Service Superannuation Amendment Act, S.O. 1960-61, c. 84.

(54) The Public Service Superannuation Amendment Act, S.O. 1965, c. 111.

(55) The Public Service Superannuation Amendment Act, S.O. 1966, c. 131.

(56) The Public Service Superannuation Amendment Act, S.O. 1970.

(57) The Public Service Superannuation Amendment Act, S.O. 1971, Second Session, c. 10.

(58) The Public Service Superannuation Amendment Act, S.O. 1974, c. 37.

(59) The Public Service Superannuation Amendment Act, S.O. 1975, c. 73.

(60) The Ontario Public Service Superannuation Act, 1924, 14 George VI, c. 7.

(61) The Public Service Amendment Act, S.O. 1928, 18 George V, c. 5.

(62) The Public Service Amendment Act, S.O. 1933, 23 George V, c. 52.

(63) The Public Service Act, S.O. 1947, c. 89.

(64) The Public Service Amendment Act, S.O. 1948, c. 74.

(65) The Public Service Superannuation Amendment Act, S.O. 1961-62, c. 122.

(66) The Public Service Superannuation Amendment Act, S.O. 1966, c. 131.

(67) The Public Service Superannuation Amendment Act, S.O. 1971, Second Session, c. 10.

(68) The Ontario Public Service Superannuation Amendment Act, S.O. 1922, 12-13 George V, c. 5.

(69) The Public Service Amendment Act, S.O. 1937, 1 George VI, c. 72.

(70) The Public Service Amendment Act, S.O. 1928, 18 George V, c. 5.

(71) The Public Service Amendment Act, S.O. 1933, 23 George V, c. 52.

(72) The Public Service Amendment Act, S.O. 1938, 2 George VI, c. 37.

(73) The Public Service Act, S.O. 1947, c. 89.

(74) The Public Service Amendment Act, S.O. 1958, c. 89.

(75) The Public Service Superannuation Amendment Act, S.O. 1960-61, c. 84.

(76) The Public Service Superannuation Amendment Act, S.O. 1966, c. 131.

(77) The Public Service Superannuation Amendment Act, S.O. 1968-69, c. 103.

(78) The Public Service Superannuation Amendment Act, S.O. 1971, Second Session, c. 10.

(79) The Public Service Superannuation Amendment Act, S.O. 1974, c. 37.

(80) The Public Service Superannuation Amendment Act, S.O. 1975, c. 73.

(81) The Public Service Superannuation Amendment Act, S.O. 1933, 23 George V, c. 52.

(82) The Public Service Act, S.O. 1947, c. 89.

(83) The Public Service Amendment Act, S.O. 1951-52, c. 88.

(84) The Public Service Superannuation Amendment Act, S.O. 1966, c. 131.

(85) The Public Service Superannuation Amendment Act, S.O. 1968-69, c. 103.

(86) The Public Service Superannuation Amendment Act, S.O. 1971, Second Session, c. 10.

(87) The Public Service Superannuation Amendment Act, S.O. 1974, c. 37.

(88) The Public Service Amendment Act, S.O. 1931, 21 George V, c. 6.

(89) The Public Service Act, S.O. 1947, c. 89.

(90) The Public Service Amendment Act, S.O. 1951-52, c. 88.

(91) The Public Service Superannuation Amendment Act, S.O. 1965, c. 111.

(92) The Public Service Superannuation Amendment Act, S.O. 1966, c. 131.

(93) The Public Service Superannuation Amendment Act, S.O. 1974, c. 37.

(94) The Public Service Superannuation Amendment Act, S.O. 1975, c. 73.

(95) The Public Service Amendment Act, S.O. 1932, 22 George V, c. 5.

(96) The Public Service Amendment Act, S.O. 1959, c. 84.

(97) The Public Service Superannuation Amendment Act, S.O. 1974, c. 37.

(98) The Teachers' and Inspectors' Superannuation Act, S.O. 1917, 7 George V, c. 58. Royal Assent was granted on April 12.

(99) The Teachers' and Inspectors' Superannuation Act, s. 2(c).

(100) Ibid., s. 11(5).

(101) An Act to amend the School Laws, S.O. 1920, 10-11 George V, c. 100.

(102) An Act to amend the School Laws, S.O. 1933, 23 George V, c. 58.

(103) An Act to amend the School Laws, S.O. 1934, 24 George V, c. 52.

(104) School Laws Amendment Act, S.O. 1936, 1 Edward VIII, c. 55.

(105) School Laws Amendment Act, S.O. 1943, 7 George VI, c. 26.

(106) School Laws Amendment Act, S.O. 1945, 9 George VI, c. 8.

(107) The Teachers' and Inspectors' Superannuation Act, S.O. 1946, 10 George VI, c. 96.

(108) The Teachers' Superannuation Act, S.O. 1949, c. 102.

(109) An Act to amend The Teachers' Superannuation Act, S.O. 1949, S.O. 1950, c. 84.

(110) The Teachers' Superannuation Act, S.O. 1953, c. 103.

(111) The Teachers' Superannuation Act, S.O. 1954, c. 93.

(112) The Teachers' Superannuation Act, S.O. 1955, c. 86.

(113) The Teachers' Superannuation Act, S.O. 1966, c. 152.

(114) The Teachers' Superannuation Act, S.O. 1967, c. 99.

(115) The Teachers' Superannuation Act, S.O. 1968-69, c. 126.

(116) An Act to amend the School Laws, S.O. 1918, 8 George V, c. 51.

(117) An Act to amend The Teachers' and Inspectors' Superannuation Act, S.O. 1919, 9 George V, c. 74.

(118) An Act to amend the School Laws, S.O. 1922, 12-13 George V, c. 98.

(119) An Act to amend the School Laws, S.O. 1932, 22 George V, c. 42.

(120) School Laws Amendment Act, S.O. 1941, 5 George VI, c. 52.

(121) The Teachers' and Inspectors' Superannuation Act, S.O. 1946, 10 George VI, c. 96.

(122) The Teachers' Superannuation Act, S.O. 1949, c. 102.

(123) An Act to amend The Teachers' and Inspectors' Superannuation Act, 1949, S.O. 1950, c. 84.

(124) In 1951 the Ontario College of Art was added, in 1953 the term "normal schools" was deleted and replaced by "teachers' colleges"; 1957 saw the addition of "provincial technical or polytechnical institute" and the Lakeland College of Arts, Science and Technology; Ryerson Polytechnical was added in 1964.

(125) The Teachers' Superannuation Act, S.O. 1957, c. 122.

(126) See for example The Teachers' Superannuation Act, S.O. 1962-63, c. 138 concerning the Ontario College of Education, or The Teachers' Superannuation Act, S.O. 1960-61, c. 98 concerning a special group from the University of Toronto.

(127) An Act to amend The Teachers' and Inspectors' Superannuation Act, S.O. 1919, 9 George V, c. 74.

(128) School Laws Amendment Act, S.O. 1943, 7 George VI, c. 26.

(129) School Laws Amendment Act, S.O. 1936, 1 Edward VIII, c. 55.

(130) School Laws Amendment Act, S.O. 1944, 8 George VI, c. 56.

(131) School Laws Amendment Act, S.O. 1945, 9 George VI, c. 8.

(132) The Teachers' and Inspectors' Superannuation Act, S.O. 1946, 10 George VI, c. 96.

(133) The Teachers' Superannuation Act, S.O. 1949, c. 102.

(134) The Teachers' Superannuation Act, S.O. 1955, c. 86.

(135) The Teachers' Superannuation Act, S.O. 1957, c. 122.

(136) School Laws Amendment Act, S.O. 1936, 1 Edward VIII, c. 55.

(137) The Teachers' and Inspectors' Superannuation Act, S.O. 1946, 10 George VI, c. 96.

(138) The Teachers' Superannuation Act, S.O. 1949, c. 102.

(139) An Act to amend The Teachers' Superannuation Act, 1949, S.O. 1950, c. 84.

(140) The Teachers' Superannuation Act, S.O. 1953, c. 103.

(141) The Teachers' Superannuation Act, S.O. 1961-62, c. 137.

(142) The Teachers' Superannuation Act, S.O. 1964, c. 115.

(143) The Teachers' Superannuation Act, S.O. 1966, c. 152.

(144) School Laws Amendment Act, S.O. 1944, 8 George VI, c. 56.

(145) The Teachers' Superannuation Act, S.O. 1966, c. 152.

(146) School Laws Amendment Act, S.O. 1945, 9 George VI, c. 8.

(147) The Teachers' Superannuation Act, S.O. 1949, c. 102.

(148) The Teachers' Superannuation Act, S.O. 1971, c. 9.

(149) The Teachers' and Inspectors' Superannuation Act, S.O. 1917, 7 George V, c. 58.

(150) An Act to amend the School Laws, S.O. 1921, 11 George V, c. 89.

(151) An Act to amend the School Laws, S.O. 1922, 12-13 George V, c. 98.

(152) An Act to amend the School Laws, S.O. 1925, 15 George V, c. 78.

(153) An Act to amend the School Laws, S.O. 1932, 22 George V, c. 42.

(154) An Act to amend the School Laws, S.O. 1933, 23 George V, c. 58.

(155) School Laws Amendment Act, S.O. 1936, 1 Edward VIII, c. 55.

(156) School Laws Amendment Act, S.O. 1945, 9 George VI, c. 8.

(157) The Teachers' and Inspectors' Superannuation Act, S.O. 1946, 10 George VI, c. 96.

(158) The Teachers' Superannuation Act, S.O. 1949, c. 102.

(159) An Act to amend The Teachers' Superannuation Act, 1949, S.O. 1950, c. 84.

(160) The Teachers' Superannuation Act, S.O. 1955, c. 86.

(161) The Teachers' Superannuation Act, S.O. 1964, c. 115.

(162) The Teachers' Superannuation Act, S.O. 1966, c. 152.

(163) The Teachers' Superannuation Act, S.O. 1971, c. 9.

(164) The Teachers' Superannuation Act, S.O. 1973, c. 36.

(165) The Teachers' and Inspectors' Superannuation Act, S.O. 1917, 7 George V, c. 58.

(166) School Laws Amendment Act, S.O. 1930, 20 George V, c. 63.

(167) School Laws Amendment Act, S.O. 1933, 23 George V, c. 58.

(168) The Teachers' and Inspectors' Superannuation Act, S.O. 1946, 10 George VI, c. 96.

(169) The Teachers' Superannuation Act, S.O. 1966, c. 152.

(170) An Act to amend the School Laws, S.O. 1918, 8 George V, c. 51.

(171) An Act to amend the School Laws, S.O. 1920, 10-11 George V, c. 99.

(172) School Laws Amendment Act, S.O. 1932, 22 George V, c. 42.

(173) The Teachers' and Inspectors' Superannuation Act, S.O. 1946, c. 96.

(174) The Teachers' Superannuation Act, S.O. 1949, c. 102.

(175) An Act to amend The Teachers' Superannuation Act, 1949, S.O. 1950, c. 84.

(176) The Teachers' Superannuation Act, S.O. 1953, c. 103.

(177) The Teachers' Superannuation Act, S.O. 1955, c. 86, s. 1(2).

(178) The Teachers' Superannuation Act, S.O. 1966, c. 152.

(179) An Act to amend The Teachers' and Inspectors' Superannuation Act, S.O. 1919, 9 George V, c. 74.

(180) An Act to amend the School Laws, S.O. 1920, 10-11 George V, c. 99.

(181) School Laws Amendment Act, S.O. 1935, 25 George V, c. 64.

(182) School Laws Amendment Act, S.O. 1938, 2 George VI, c. 35.

(183) School Laws Amendment Act, S.O. 1941, 5 George VI, c. 52.

(184) School Laws Amendment Act, S.O. 1943, 7 George VI, c. 26.

(185) The Teachers' and Inspectors' Superannuation Act, S.O. 1946, 10 George VI, c. 96.

(186) The Teachers' Superannuation Act, S.O. 1949, c. 102.

(187) The Teachers' Superannuation Act, S.O. 1959, c. 99.

(188) The Teachers' Superannuation Act, S.O. 1966, c. 152.

(189) An Act to establish the Ontario Municipal Employees Retirement System, S.O. 1961-62, c. 97.

(190) Ontario Regulation, 88/65.

(191) Ontario Regulation, 249/65.

(192) Ontario Regulation, 8/66.

(193) Ontario Regulation, 293/68.

(194) Ontario Regulation, 208/71.

(195) Ontario Regulation, 392/72.

(196) Ontario Regulation, 636/73.

(197) Ontario Regulation, 722/74.

(198) Ontario Regulation, 1035/75.

(199) Ontario Regulation, 130/78.

(200) The Ontario Municipal Employees Retirement System Amendment Act, S.O. 1964, c. 82.

(201) The Ontario Municipal Employees Retirement System Amendment Act, S.O. 1965, c. 90.

(202) Ontario Regulation, 396/67.

(203) Ontario Regulation, 189/72.

(204) Ontario Regulation, 419/72.

(205) The Ontario Municipal Employees Retirement System Amendment Act, S.O. 1976, Second Session, c. 27.

(206) Ontario Regulation, 936/77.

(207) Ontario Regulation, 249/65.

(208) Ontario Regulation, 936/77.

(209) Ontario Regulation, 8/66.

(210) Ontario Regulation, 798/76.

(211) Ontario Regulation, 88/65.

(212) Ontario Regulation, 936/77.

(213) Brief 123: from the Ontario Municipal Employees Retirement Board, p. 1.

(214) Ontario Regulation, 88/65.

(215) Ontario Regulation, 936/77.

(216) Ontario Regulation, 8/66.

(217) Ontario Regulation, 42/70.

(218) Ontario Regulation, 189/72.

(219) Ontario Regulation, 392/72.

(220) Ontario Regulation, 8/74.

(221) Ontario Regulation, 936/77.

(222) Ontario Regulation, 8/66.

(223) Ontario Regulation, 456/75.

(224) Ontario Regulation, 936/77.

(225) The Ontario Municipal Employees Retirement System Amendment Act, S.O. 1968, c. 88.

(226) The Ontario Municipal Employees Retirement System Amendment Act, S.O. 1970, c. 131.

(227) The Ontario Municipal Employees Retirement System Amendment Act, S.O. 1973, c. 159.

(228) The Ontario Municipal Employees Retirement System Amendment Act, S.O. 1974, c. 102.

(229) The Ontario Municipal Employees Retirement System Amendment Act, S.O. 1965, c. 90.

(230) Ontario Regulation, 435/67.

(231) Ontario Regulation, 42/70.

(232) Ontario Regulation, 793/74.

(233) Ontario Regulation, 456/75.

(234) Ontario Regulation, 798/76.

(235) 9 George V, c. 16, s. 6cc and 6ccc.

(236) Sources differ as to the scale in use, one citing a range from 2.5 per cent to 5.5 per cent and the other citing 3 per cent to 6 per cent, as shown below:

Age at entry	Contribution rate	
	Source I	Source II
	(Per cent)	
Up to 30	2.5	3.0
30 to 31	2.65	3.15
31 to 32	2.95	3.45
32 to 33	3.25	3.75
33 to 34	3.55	4.05
34 to 35	3.85	4.35
35 to 36	4.15	4.65
36 to 37	4.3	4.8
37 to 38	4.45	4.9
38 to 39	4.6	5.1
39 to 40	4.75	5.25
40 to 41	4.9	5.4
41 to 42	5.05	5.55
42 to 43	5.2	5.7
43 to 44	5.35	5.85
44 to 45	5.5	6.0

(237) Order-in-Council of June 25, 1926 with effective date March 26, 1926.

(238) Order-in-Council of December 15, 1938 with effective date November 1, 1938.

(239) Order-in-Council of December 28, 1939 with effective date January 1, 1940.

(240) Ontario Regulation, 231/50.

(241) Ontario Regulation, 80/58.

(242) Ontario Regulation, 16/62.

(243) Ontario Regulation, 345/65.

(244) Ontario Regulation, 309/67.

(245) Ontario Regulation, 22/71.

(246) Ontario Regulation, 80/58.

(247) Ontario Regulation, 347/67.

(248) Ontario Regulation, 245/68.

(249) Ontario Regulation, 135/71.

(250) Ontario Regulation, 123/74.

(251) Ontario Regulation, 100/75.

(252) Ontario Regulation, 315/76.

(253) Ontario Regulation, 694/77.

(254) Ontario Regulation, 219/79.

(255) Order-in-Council of June 25, 1926 with effective date March 26, 1926.

(256) S.O. 1949, c. 73.

(257) Ontario Regulation, 9/60.

(258) Ontario Regulation, 309/67.

(259) The Power Commission Act, S.O. 1968, c. 98.

(260) Ontario Regulation, 22/71.

(261) Ontario Regulation, 231/50.

(262) Ontario Regulation, 345/65.

(263) Ontario Regulation, 309/67.

(264) Ontario Regulation, 231/50.

(265) Ontario Regulation, 309/67.

(266) Ontario Regulation, 22/71.

(267) Ontario Regulation, 219/79.

(268) Order-in-Council of June 25, 1926 with effective date March 26, 1926.

(269) Ontario Regulation, 231/50.

(270) Ontario Regulation, 309/67.

(271) Ontario Regulation, 315/76.

(272) The Power Commission Act, S.O. 1949, c. 73.

(273) Order-in-Council of June 25, 1926 with effective date March 26, 1926.

(274) Ontario Regulation, 231/50.

(275) Ontario Regulation, 218/55.

(276) Ontario Regulation, 33/65.

(277) Ontario Regulation, 309/67.

(278) Ontario Regulation, 22/71.

(279) Ontario Regulation, 219/79.

(280) Ontario Regulation, 213/61.

(281) Ontario Regulation, 309/67.

(282) Ontario Regulation, 22/71.

(283) Ontario Regulation, 165/73.

(284) Ontario Regulation, 231/50.

(285) Ontario Regulation, 345/65.

(286) Ontario Regulation, 309/67.

(287) Ontario Regulation, 22/71.

(288) Ontario Regulation, 315/76.

(289) Order-in-Council of June 25, 1926 with effective date March 26, 1926.

(290) Order-in-Council of December 28, 1939 with effective date January 1, 1940.

(291) Ontario Regulation, 231/50.

(292) Ontario Regulation, 16/62.

(293) Ontario Regulation, 22/71.

(294) Ontario Regulation, 315/76.

(295) Ontario Regulation, 287/59.

(296) Ontario Regulation, 212/62.

(297) Ontario Regulation, 9/64.

(298) Ontario Regulation, 345/65.

(299) Order-in-Council of June 25, 1926 with effective date March 26, 1926.

(300) Ontario Regulation, 231/50.

(301) Ontario Regulation, 80/58.

(302) Ontario Regulation, 16/62.

(303) Ontario Regulation, 309/67.

(304) Ontario Regulation, 123/74.

(305) Ontario Regulation, 315/76.

(306) Ontario Regulation, 219/79.

(307) Ontario Regulation, 231/50.

(308) Ontario Regulation, 80/58.

(309) Ontario Regulation, 347/67.

(310) Ontario Regulation, 123/74.

(311) Ontario Regulation, 219/79.

(312) Order-in-Council of December 15, 1938 with effective date November 1, 1938.

(313) Order-in-Council of December 28, 1939 with effective date January 1, 1940.

(314) Ontario Regulation, 80/58.

(315) Ontario Regulation, 309/67.

(316) Ontario Regulation, 315/76.

(317) The Power Commission Act, S.O. , 9 Geoge V, c. 16.

(318) The Power Commission Act, S.O. 1949, c. 73.

(319) Ontario Regulation, 231/50.

(320) Ontario Regulation, 309/67.

(321) The Power Commission Act, S.O. 1960, c. 85.

(322) The Corporations Act, S.O. 1953, c. 19.

(323) The Power Commission Act, S.O. 1965, c. 100.